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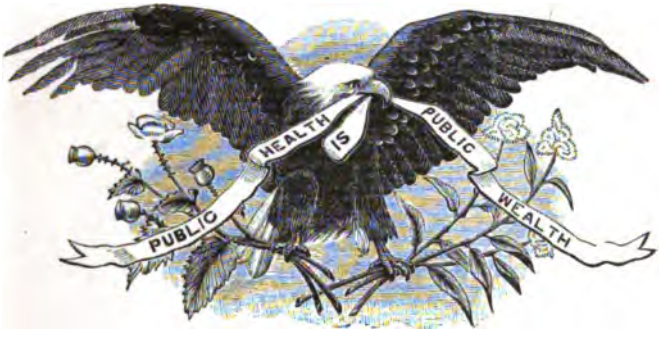

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PRACTICAL SANITATION,*

FOR THE RESTRICTION AND PREVENTION OF DIPHTHERIA, SCARLET FEVER, MEASLES, CHOLERA, AND OTHER CONTAGIOUS OR INFECTIOUS DISEASES.

J. H. RAYMOND, M.D., Health Commissioner.

DIPHTHERIA, scarlet fever, measles, and small-pox are highly contagious diseases, attacking persons of all ages, and may be contracted from those who are already affected, from the clothes that they have worn, and from everything which has been in the room with them. Even the walls of the room may be a source of infection to persons coming into it after the patient has left it, unless the infectious material is destroyed. In order to prevent the spread of these diseases in a family or house where they exist, and to promote the recovery of the sick, the following simple measures should be conscientiously and rigidly carried out, thereby preventing much suffering and saving human life.

An upper, sunny room, provided if possible with an open fireplace, and with no children on the same floor, should be

*Recently Issued by the Department of Health of Brooklyn, N. Y.

arranged for the patient by removing everything from it which can possibly be spared, such as books, clothing, carpets, upholstered furniture, and window-curtains; also plants, birds, and other pets, remembering that when once the patient has entered the room nothing can with safety be removed until disinfected. By thus stripping the room of all articles except those absolutely necessary, the subsequent disinfection is much more easily performed. If it is deemed necessary, a few small rugs will take the place of the carpet.

The fireplace serves a double purpose: first, as a means of ventilation; and second, by keeping a small fire burning therein, when the weather will permit, the pieces of soft muslin or other material, which should always be used instead of towels or handkerchiefs in wiping the secretions from the mouth or nose, especially in diphtheria, can readily be destroyed by fire, and thus contagion through them prevented.

One or two adults should take the entire charge of the patient, under no circumstances coming in contact with other persons, especially children. Kissing and "taking the breath" of persons having contagious disease are especially dangerous, and should always be avoided. Open windows and open fireplaces, with fire in them day and night, avoiding draughts and chilly air, protect the sick and those who nurse them.

Nothing should be removed from the room when the patient has once entered it until it has been thoroughly disinfected.

Books, scrap-books, toys, or other playthings should always be destroyed at the termination of the sickness, as being undoubted carriers of contagion. Locks of hair and other keepsakes have also been known to spread contagious disease.

Nurses should keep themselves and their patients as clean as possible, remembering that the more the infection accumulates the more dangerous does it become. Special care should be taken in changing sheets and the clothing not to shake them or disturb them more than is absolutely necessary to remove them. As these acts disseminate the particles of skin which are removed with them, and which convey the germs of the disease, they should be removed carefully and folded together, and immediately disinfected.

DISINFECTION.

It is a popular idea that anything which destroys an offensive odor is a disinfectant. This is not only erroneous, but harmful, as reliance is thus placed on substances that in nowise act as destroyers of infectious material, which latter substances are the only true disinfectants. The methods recommended in this circular are, to a considerable extent, based upon the results of the work of the Committee on Disinfectants of the American Public Health Association.

DISINFECTANTS.

The agents recommended herein for disinfection are :

1. Fire.
2. Boiling water.
3. Chloride of lime or chlorinated lime, either dry or in solution, as Standard Solution No. 1.
4. Solution of chlorinated soda, diluted as Standard Solution No. 3.
5. Sulphur.
6. Bichloride of Mercury.

Bichloride of mercury, or corrosive sublimate, a powerful disinfectant, is included in the above list for one purpose only ; that is, for the disinfection of privy-vaults which contain a large amount of material believed to be infected. As this circular is intended for general distribution, the writer hesitates to recommend for general use an agent which may, through improper use, endanger life.

Fire.—As already directed, the materials used in wiping away the discharges of the sick may be burned in the open fireplace, if such there be. In general, this method of disposal is to be recommended for all substances which have been exposed to infection, which cannot be treated with boiling water, and could it be carried out in all cases, would make disinfection a very simple matter. If it is desired to burn substances suspected of being infected, and there is no fire in the room, such substances may be wrapped in a sheet soaked with Standard Solution No. 3, hereafter referred to, and in this condition conveyed to the fire in the furnace or elsewhere.

Boiling Water.—Experiment has demonstrated that boiling

in water for half an hour will destroy the vitality of all known disease-germs. This is therefore recommended as the best means to be employed in the disinfection of all articles which can be thus treated, such as the body-clothing of the patient, the bedclothes, towels, etc. All utensils which are used in the room in the feeding of the patient, such as plates, tumblers, spoons, knives, forks, etc., should likewise be treated with boiling water before being removed from the room. Food itself not consumed by the patient should not be used by others, as it is liable to become infected in the sick-room.

If, as will often be the case, there are no facilities for treating articles with boiling water in the sick-room, they may with safety be removed to another part of the house for this treatment if they are carefully enveloped in a towel or sheet, as the case may require, which has been thoroughly soaked with either Standard Solution No. 1 or Standard Solution No. 3. Thus enveloped, they should be put in the water, and boiled for the required time.

Chloride of Lime.—This substance, also called chlorinated lime, to be effective as a disinfectant, must be of the best quality, and in purchasing it only that should be accepted which is enclosed in glass bottles, as when packed in paper or wooden boxes it is liable to have so deteriorated as to be worthless for disinfecting purposes. When dissolved in water, in the proportion of four ounces to the gallon, it forms the Standard Solution No. 1, recommended by the committee on disinfectants. The solution thus prepared is to be used in the disinfection of discharges in contagious diseases, especially in typhoid fever and cholera. One pint should be well mixed with each discharge; after ten minutes disinfection is completed, and the contents of the vessel may be then safely thrown in the privy vault or water-closet. The expectorated matter of those sick with consumption should be discharged into a cup half filled with this solution or with Standard Solution No. 3.

To thoroughly disinfect a privy vault, Standard Solution No. 1 should be used in large quantities—one gallon for each gallon of material in the vault; the surface of the contents should be subsequently daily covered with the dry chloride of lime. The cost of the Solution No. 1 is about three cents a gallon.

Solution of Chlorinated Soda.—To be effective, this solution must contain at least three per cent. of available chlorine, and in purchasing it care should be exercised to obtain such a quality. This is sometimes spoken of as Labarraque's Solution; but, as this latter substance is too weak to act as a disinfectant, the name is liable to mislead, and is therefore here not used. The Standard Solution No. 3 of the committee is made by adding five parts of water to one part of the solution of chlorinated soda. The cost of this solution is about ten cents a gallon. When thus diluted, it may be used for all the purposes for which Standard Solution No. 1 was recommended, and is of a somewhat more agreeable odor, though more expensive.

This solution should be used to cleanse portions of the body soiled with discharges of those sick with infectious diseases, or the hands of attendants similarly soiled.

Bichloride of Mercury (Corrosive Sublimate), is recommended in this circular to be used only in the disinfection of privy-vaults which contain so much material, believed to be infected with the germs of typhoid fever or cholera, that the disinfection by Chloride of Lime would be impracticable. In using this it should be dissolved in the proportion of one ounce of Bichloride of Mercury to one gallon of water; this quantity will disinfect four gallons of infected excremental matter.

TREATMENT OF THE BODY OF THE PATIENT AFTER RECOVERY OR DEATH.

When the patient has recovered, he should be first sponged over with the solution of chlorinated soda, diluted in the proportion of one part to twenty parts of water; and, indeed, during the course of the illness, occasional sponging of the body with this very diluted solution, under the direction of the attending physician, will be of value in preventing the escape from the surface of the body of infectious material. When, after recovery, the body has been thus sponged, not omitting the head and hair, a thorough washing of the body with soap and warm water should follow, and the patient dressed in clothes which have not been exposed to infection. This should take place in another room than the one occupied during the illness.

Should the case result fatally, the body should be thor-

oughly sponged with either Standard Solution No. 1 or No. 3, and then wrapped completely in a sheet saturated with one of these solutions, and enclosed in a coffin, which is to be closed, and the interment must take place within twenty-four hours, and be strictly private. If the interment is to take place at a distance, requiring transportation by any other means than a hearse, the coffin must be of metal, or metal-lined, and hermetically sealed.

DISINFECTION OF THE CLOTHING AFTER RECOVERY OR DEATH.

The clothing of the patient should be treated in the manner already described as necessary during the sickness. Whatever can be boiled in water should be thus disinfected; articles which cannot be boiled should, if circumstances will permit, be burned; all other articles should be left in the room to be subjected to the fumigation hereafter to be described, and until thus treated the room and its contents should be closed with lock and key, to prevent any one from entering. If it is desired to burn any articles, and facilities for it do not exist in the house, the Department of Health should be notified, and an officer will call and remove the articles for destruction.

DISINFECTION OF ROOM AND CONTENTS.

The room, having been vacated by the patient, should first be fumigated by burning sulphur. Nothing should be removed from the room until this is completed, unless it has been disinfected in the manner already described. Everything to be fumigated should be so opened and exposed that the sulphur-fumes can come in contact with all portions thereof. All cracks of doors and windows, fireplaces, or other channels by which the gas may escape, should be tightly closed, using cotton wadding when necessary. For a room ten feet in all its dimensions—that is, one containing one thousand cubic feet of air-space—two pounds of broken sulphur and one pound of flowers of sulphur should be provided, and an increased amount for larger rooms in the same proportion. This quantity is important, as less will not so efficiently accomplish the desired disinfection. The sulphur should be placed in an iron pot, and this in turn on bricks in a wash-tub containing water,

or in a large coal-scuttle containing wet ashes. This precaution is necessary to prevent setting fire to the floor, which would occur if the pot were placed directly on the floor or carpet, or by the sputtering of the sulphur, which may happen when it contains moisture. The vessel containing the sulphur should not be one with soldered joints, as the intense heat would melt the solder. The pot should be placed in the centre of the room; if the room is a large one, containing several thousand cubic feet of air-space, several pots should be provided, distributed at different points. Everything being in readiness, sufficient alcohol to moisten the sulphur should be poured on it, a lighted match applied, and when it is seen that the sulphur is well ignited the room should be left, and the door shut, and all cracks outside, including the keyhole, closed by paper, cotton, or other material. At the end of ten hours the fumigation is completed. Great care should be exercised in emptying the room of the sulphur-fumes, as these cannot be breathed, and are excessively irritating to the eyes and throat. If possible, a window should be opened from the outside, and through this the fumes permitted to escape; if this is impracticable, all the windows and doors of adjoining rooms should be opened, and then the door of the fumigated room, and through these outlets the fumes allowed to find an exit. Thorough airing will remove the slight odor which remains.

The fumigation being completed, all wood-work, as of floors, windows, and doors, and the walls and other surfaces, should be washed over with Standard Solution No: 3; particular attention being paid to cracks, crevices, and out-of-the-way places, in which dirt ordinarily finds a lodgment, and from which it is with difficulty removed. A subsequent washing with hot water and soap will complete the cleansing process, and the room may be considered again habitable.

ADDITIONAL PREVENTIVE MEASURES, TO BE EMPLOYED IN THE ABSENCE AS WELL AS IN THE PRESENCE OF CONTAGION.

See that the whole house, from cellar to attic, is clean. Keep the cellar dry, well ventilated, and well whitewashed, and never allow, even for a day, garbage or other filth to be kept in it.

Open the windows of sleeping-rooms every day for as long a time as possible, and in every way obtain as much fresh air as possible.

Abolish the privy in the yard if there is a sewer in the street, and substitute a well-flushed water-closet; if there is no sewer, see that the vault is water-tight, emptied frequently, and kept inoffensive and innocuous by use of the Standard Solution No. 1, previously referred to, using a gallon of the solution for every gallon of material in the vault, and subsequently sprinkling the dry chloride of lime freely over the surface of the contents daily.

Be sure that there are no leaks or defective traps or joints in the drain-pipes of the house, through which the gases from the decomposing filth contained therein can enter to pollute the air you breathe.

When the children complain of sore throat, send promptly for a competent physician; a few hours' delay may cost their lives. If the disease is pronounced contagious, see that it is reported at once to the Department of Health, and keep the other children from schools of all kinds until a permit is procured for their return. Keep the patient and the attendants quarantined from other members of the family and house. The inspector of the district in which you live will call at your house as soon as the department is notified, and will give all possible advice and assistance, and will furnish the school-permits when the danger is passed.

School-permits will be given, on application to the inspector, as soon as the patient has fully recovered and the sick-room has been disinfected; in cases of scarlatina and measles this will not be until desquamation—or peeling off of the skin—is completed. The measures here recommended are to be used in all contagious diseases, whether diphtheria, scarlet fever, measles, small-pox, or others.

VENTILATION WITH AIR FROM SUPERIOR COUCHES IN PLACE OF INFERIOR COUCHES.

By EDWIN CHADWICK, C.B.

IN sanitary inquiries my attention was early directed to instances of couches of air of malarious influence, such as this: A medical officer, pointing to a mist spread like a sheet over a valley, said, "That sheet just covers the bulk of my patients; out of it, or above it, I have nothing scarcely but midwifery cases and accidents. I have had instances of children whose heads were above a visible mist escaping attacks, while the smaller children covered by the mist suffered from them; of examples of the occupiers of the cellars, and the lower stages in towns, suffering from cholera and other epidemic visitations, while those living in the upper flats or highest stories entirely escaped from them, except in the attics, for which there was special reason; cases of experiences in India, where men could not travel in safety at night across valleys, while men on elephants, being above the malarious couch, could do so; of people raising their habitations on stilts to escape the mephitic influences of which they have had experience."

Mr. Glaisher, the aeronaut, writes to me: "When in the car of a balloon, I have been struck with the definite boundary of mists at times when there has been but little generally, and I found afterward that the mists were located over marshes, or clayey soil, when gravelly soil was free. The ventilation of the Underground Railway could be effectually carried out by your suggestion."

The general effect of land drainage has been to reduce mists, and in some instances to remove them entirely. In such instances it has reduced or removed the plague of midges in England. In one instance in Algeria of which I was informed, the drainage of a district, and its close cultivation, entirely removed the plague of mosquitoes which had rendered it almost

uninhabitable. In the Fen districts of Lincolnshire, the land drainage has reduced mists, and so reduced ague that ounces of bark are not now used where pounds were used formerly. It is for entomologists to show on what these animalcules subsist where there are no human or animal subjects to prey upon, and what is the superficial extent of their feeding ground. On the occasion of choleraic visitations, extraordinary developments of insect life were in some instances observed, generally in low-lying couches, but they passed without any examination of which I am aware. Swallows and insectivorous-feeding birds appear habitually to fly now in pursuit of prey. I point out these incidents for the observation of naturalists, and the favor of information from them.

From Highgate Hill I have observed mists spread over the Metropolis like a blanket, and the upper dome of St. Paul's Cathedral appearing clear and bright above it like a spike through the blanket.

I have ascended that dome and found there a clear, freshening breeze, as good in sensation as any on the Surrey hills; while the air beneath in the adjacent streets was comparatively stagnant and unrefreshing.

On a discussion of the subject with the late Dr. Neil Arnott, a pre-eminently good sanitarian and an able mechanician, it appeared that we might form a pure-air company, which would engage to draw the air from a suitable height above to common couches, and distribute it into houses by engine power, or as gas is distributed, and do it with a profit at a very low rate, or for some few shillings a year give even a better air than people generally obtain in suburban residences. The principle may now be presented for consideration, for hospital construction, and the excessive mortality that is prevalent in the larger hospitals beyond that which prevails in the smaller ones, and in reduction of the necessity of washing the air in the town hospitals for the performance of operations.

I have visited hospitals in Paris where the methods of *internal* ventilation are, in my view, excellent and superior, but where all draw in the air from the lower couches of the outside street air. I do not know of one instance where the expedient of drawing in a superior air from a height has been adopted or thought of. In England I have known of hospitals very well

ventilated—internally, mechanically—which have drawn their external air from lower couches that were positively very bad, and the more the wards were ventilated the worse they often were. Indeed, it is sometimes proposed as a principle, as against that of extraction, that ventilation is best effected by "currents of fresh air brought in by open windows placed in opposite sides of the wards." But this "fresh air" is the common street air, really foul air polluted by street emanations from sewers and cesspools, requiring washings before operations can be safely performed. It is well known that surgical operations cannot be performed with safety in town air (unless it is washed) that may be performed with increased chances of favorable results in a good suburban air.

In Paris two systems of ventilation were in competition when I visited the hospitals: one of "propulsion," or driving in the air; the other of "aspiration," or of drawing it out by suction. It appeared that the practice of propulsion drove the air in heaps, leaving corners stagnant; whilst the method of aspiration, or of suction, operated perfectly in removing the air the nearest from the points of vitiation in the time and mode required, and to introduce really fresh air from the points farthest from vitiation and at the temperature required; and also to maintain passages and cabinets at a temperature equal to that of the interior rooms. Notwithstanding the default of ventilating with the generally cesspool-tainted and impure street air, the effect of the system of "aspiration" appeared to be in advance of at least one-fourth of the common methods of hospital ventilation.

This principle of aspiration appears to me to be peculiarly adapted to drawing in the air from the superior couch, obtained from two, three, four, or five hundred feet, or whatever height it may be obtained.

The principle is peculiarly applicable to India and to Eastern cities generally, for the securing of refreshing sleep free from the plague of mosquitoes.

A friend, a great traveller, found out that mosquitoes lived and fed exclusively in the animalized gases diffused among the lower couches of air. He suffered intensely from the bite of these insects, and, to escape them when he came near the coast, he made his bed aloft on the crosstrees of the mainmast;

and when he went on shore he astonished the natives by seeking for some steeple, where he could make his bed.

The principle proposed would bring in air free from the insects, and carry those in the building away from it. The engine-power required for the service would be less than that for ventilation by the *tatties*.

The system of extraction as managed by Leon Duvoir le Blanc, allowed the most complete adaptation to conditions. At its outset he asked the medical authorities: At what temperature do you require the air to be kept? At 60 deg. How often do you require it to be changed? Once every hour, night as well as day. In what direction do you require it to be removed? Downwards, between each bed. And this was done completely by a hot-water tank on the roof. I have been beset by other questions, and have not been in a position to press observation and experiments for precise results, as I would now do. I obtained a promise from my late lamented friend, Dr. Angus Smith, who had been the foremost in analyzing air, that he would make the experiments I suggested: of sending up a balloon with a self-registering thermometer to ascertain the temperature at different heights, and have a bottle filled with water, with a self-closing tap, which might be opened from below, and specimens of the air brought down to test its quality. Hence, for the East or anywhere, it may be stated that we are not dependent on the superior couches of air for the temperature. It may be given to it below in various ways. I was assured that at La Riboisière the contract to keep the temperature night and day at sixty was duly performed. When it was below that temperature it was warmed by being led over warmed surfaces on admission, and when it was above that temperature it was cooled by being passed over surfaces cooled down by evaporation. I was assured that the practicability of doing this may be considered as settled. All this was done at a less expense than that of warming edifices by the ordinary method; and all this, it is suggested, can be done for sleeping-rooms in India, and for offices; but the most convenient power for working the system of "aspiration" would, I expect, be by hot-air engines, which may be had of one, two, or three horse-power, and that go on working for a long time, with little care. Small steam-engines would be available for

larger buildings. If the principle be approved, plans for its application according to conditions may be got out.

In the construction of towers for the attainment of pure air, it appeared to me undesirable to construct them of the common absorbent brick. Constructions of non-absorbent concrete appeared to me to be the most eligible, and that constructions with large hexagonal pots would have considerable advantages. The requisite heights would have to be ascertained experimentally. The impure couches of air might often be avoided by inconsiderable elevations. Experimentation and observations on the points suggested would be of the greatest importance in the tropical districts, where rest and refreshing sleep are difficult to be got, and where even existence is a torment.

NOVEL SYSTEM OF DRAINAGE.—Albany, Ga., has been ingeniously relieved of what has long been a troublesome nuisance to her in the shape of a stagnant pond of water, which covered from one to two acres. The *News and Advertiser* says that it was all cleared off, and the bottom made perfectly dry, by Captain J. G. Stephens, the faithful and efficient chairman of the Street Committee of the present City Council, who had a derrick and windlass erected near the edge of the pond, and put a force of hands to drilling a hole into the ground, on the same principle that artesian wells are bored. His object was to find a subterranean stream or passage, into which the pond could be drained. Such a passage was found at a depth of thirty-three feet, and then a square well was dug down to it and curbed all the way. Everything being ready, a ditch was dug, and the water from the pond was turned into the well. It ran in through a twelve-inch terra cotta pipe at the rate of about six hundred gallons per minute, and disappeared as fast as it reached the bottom of the well.

PEPTONIZED MILK-DIET.*

By WALTER B. CHASE, M.D., Brooklyn, N. Y.

THE value of milk-diet in disease is becoming generally recognized. Being the only single article of food which combines in itself all the elements of nutrition, its use needs no argument, and its wide range of applicability renders it the more useful.

In some individuals, and in certain conditions of the alimentary canal, it is difficult of digestion. In infantile life, when artificial feeding may be required, its use is not always acceptable.

Its inapplicability in the conditions referred to is due largely to the frequent indigestibility of caseine.

The acid of the stomach acts rapidly, and coagulates the milk into curds large or small, but sufficiently large as they pass from the stomach to resist the solvent action of the alkaline juices of intestinal digestion, and appear as such in the stools.

For this reason salts of soda and potassa, or lime-water, are added to the milk to retard the rapid action of the gastric juice, and so diminish the primary size of the curds. So, too, farinaceous material is added to the milk for a similar purpose.

In fact, this curdling process of milk in the stomach is the principal obstacle to its universal use as a substitute for mother's milk, and as an article of diet in more advanced life, both in acute and chronic disease.

During the summer months young children fed partially or entirely on milk are liable to suffer from intestinal irritation and inflammation from this cause.

This is a matter which has engaged the thought of most medical men.

* Read before the Medical Society of the State of New York, February 4, 1885.

Dr. J. Lewis Smith pointed out the fact that in diluting cow's milk for babies' use it was better accomplished by the addition of barley-water instead of water, the former making a solution of the caseine rather than a mixture, and thus step by step these difficulties have in a degree been overcome. While much has been accomplished, perfection is not reached. Happily, as both the physiology and chemistry of digestion has become better understood, a more careful study of the digestive ferments and their practical application has become established. Peptonized milk seems, in some good degree at least, to meet the required indications.

This can be accomplished briefly as follows: To a pint of milk raised to a temperature of about 100° F., not below the normal heat of the body, add five grains dry extract pancreatis dissolved in a little water; afterward stir into the milk fifteen grains potassi bi-carb. Keep the milk at the temperature already indicated until the addition of some acid—strong vinegar will answer—fails to coagulate a small portion of the milk removed for that purpose.

The degree to which the milk should be pancreatized wil be best ascertained by its digestibility. It may require from fifteen minutes to an hour, or more.*

This process may be arrested by boiling the milk, or, better still, that the temperature be rapidly lowered by putting it into a refrigerator and keeping it at a lower temperature, when it may be warmed for use.

The value of pancreatized milk seems to be that it is easy of digestion and assimilation, and is almost entirely absorbed.

To a patient fed exclusively on milk given when alkaline or lime-water has been added, the undigested curds may accumulate rapidly in the lower intestines, requiring frequent evacuation, greatly to the annoyance, and may be to the injury, of the patient.

In fact, common experience goes to show that much care is often required on these troublesome accumulations, if not impactions.

Milk when heated as suggested seems thinner, and is more

* The extract pancreatis used and recommended is that prepared by Fairchild Brothers & Foster, New York.

acceptable to the taste and stomach, than clear milk, while its sustaining power is evidently increased. I give one or two examples of its use.

A young man recently under my care, suffering from general idiopathic peritonitis from blood-poisoning by sewer-gas, took from one to three pints daily, which was his only nourishment save a little chicken-broth and cocoa. His stomach, though very irritable, tolerated the pancreatized milk after beef-tea had been repeatedly rejected. His bowels were confined for a period of about ten days by the active exhibition of opiates, and allowed to move spontaneously on the subsidence of the inflammation. His strength was well sustained, and he made a prompt recovery, but notwithstanding the period of time which elapsed before the bowels were opened the fecal accumulation was small. I know of no other method by which the system could have been so well nourished.

Dr. Cornelius Alcott, of Brooklyn, related to me a very interesting and instructive instance of the supporting power of peptonized milk, in the case of a man passed middle life, suffering from schirrus of the kidney.

The disease had reached a point where the stomach would tolerate neither medicine nor the food already used, and death seemed imminent, but life was prolonged for a period of more than two years by this diet alone.

During this time he suffered little or no pain, though the malignant growth filled a large portion of the abdominal cavity, and extensive secondary deposits had taken place.

In a patient now under my care, suffering from a suspicious omental growth, causing interrupted intestinal obstruction, in which there has been for days absolute incapacity of the stomach to take any food, a mixture of strong beef-tea and peptonized milk in equal quantities, as an enema, has been retained, and by it the patient has been fairly well nourished and his strength sustained.

This brief paper is presented not with the expectation that milk, as here recommended, will be the best diet for all sick persons, but with the belief that its use will, in a *large number of cases*, both in the infant and adult, best sustain the patient, and so enhance the chances of recovery.

THE FEVER ENDEMIC IN LOUISVILLE.*

By J. N. M'CORMACK, M.D., Secretary of the Kentucky State Board of Health.

SINCE the latter part of October last I have been engaged in the name of this Board in an investigation into the cause of an endemic of typhoid fever then alleged to be prevailing in the city of Louisville. In this work I have availed myself of the meagre health records of the city for the past sixteen years, have personally examined a number of the fever cases, and the premises where they occurred, have inspected the streets, alleys, topography, and natural and artificial drainage of the district especially afflicted by the disease, and personally and otherwise made special inquiries as to the method of construction, location, and condition of the vaults and wells, the source and character of the water and milk supply, and of other conditions and habits likely to influence the health of the inhabitants of this locality. To a lesser degree I have conducted similar investigations as to the health conditions of other portions of the city. In all this work I have had the hearty co-operation of many of the leading physicians of Louisville.

In consequence of the fact that physicians and heads of families are not required to report to the health officer each case of disease dangerous to the public health, it is impossible to give facts bearing on the history of typhoid fever in Louisville in previous years, except those furnished by the mortality tables. With four exceptions, which will be noticed, these tables have been obtained as far back as 1868, and they show the following death-rate from this disease: 43 in 1868, 33 in 1869, 75 in 1871, 82 in 1875, 53 in 1876, 44 in 1877, 72 in 1878, 86 in 1879, 96 in 1880, 146 in 1881, 114 in 1882, 106 in 1883, 145 in 1884. No health report was made in 1870, 1872, and 1873, and that for 1874 could not be obtained. In most of these tables deaths from typho-malarial fever were reported as typhoid fever, and to escape confusion this has been done by me for exceptional years. From these figures it will be seen that although this disease has attracted unusual attention from

* Read to the Kentucky State Board of Health, at its quarterly meeting, May, 1885.

the medical profession and the public of the city recently, the death-rate from it last year was one less than in 1881, and not greatly in excess of that of 1882 and 1883, and that on the whole the death-rate from this cause has slowly but surely increased with the years. These figures also show that, whatever the cause of the disease may be, it has taken up a permanent residence in Louisville, unless extraordinary efforts are made to drive it out. In this connection it would be interesting to know the location of cases, or at least of the principal number of cases, in former years, and whether or no the same house or locality has furnished successive cases year after year; but no means exist for obtaining this information, for the reasons stated.

As to individual cases of fever, my inquiries have only been in regard to cases occurring from August 1 to December 1, 1884, and had reference entirely to the character and cause of the disease. By means of blank slips for individual cases, information was asked from the attending physician on the following points in regard to each case: Name the location, date of attack, distance of vault from house, its depth and condition, condition of cellar, method of disposal of house-refuse and kitchen-slops, source of water-supply, source of milk-supply, whether or no the house in which the case occurred is in the flooded districts, whether or no it was possible with the facts at hand to trace the disease to a previous case of the same character, and, under the head of remarks, any other facts observed bearing on the character or cause of the disease. In this way such facts have been more or less perfectly collected in regard to 387 cases occurring within the dates mentioned, which I estimate to be about two-thirds of the cases occurring in that time. Of these 387 cases 247 were located in the "west end," a large majority of them within the fever district shown on the map, and particularly in the western portion of this district—the remainder being scattered over other portions of the city. The condition of the vault is noted in 158 cases, being good in ninety-two cases, and bad in the remainder. It is uniformly stated, when reference is made to this point, that the vaults extend to the gravel formation. In a number of instances it is stated that the vault on the same or adjoining lots is from two to fifteen feet from the house; in many that it is

full, and in some that it is overflowing. In eight cases the water-closet was in the house. The condition of the cellar was noted in 143 cases, being good in 102 and bad in the remainder. The method of disposal of house-refuse and kitchen-slops is noted in 160 cases, being carted away, cremated, or otherwise properly disposed of in 16 cases, and thrown in the back yard, alley, gutter, adjoining lot, or fed to pigs, in 144 cases. The source of the water-supply is noted in 314 cases, being from hydrants in ten cases, from cisterns in six cases—four of these cisterns being located in the cellar—and from wells in 298 cases. The source of the milk-supply is not often stated in sufficiently definite terms for any satisfactory conclusion. Four of these cases were located in the flooded districts. In many instances it is noted that pigs, fowls, cows, or horses are kept on the premises, and in very many that the back yards and alleys are foul. In a few instances it is stated that the premises are in good condition; but in such cases no note is made of the condition of the surrounding premises. In a number of instances more than one case is reported from the same house, and in three instances as many as four cases. The large majority of the cases are reported as mild in character and usually of short duration. In no case, so far as stated, could the disease be traced to a previous case.

From the Christian name in the reports the sex could be determined in 210 cases, and of these 91 were males and 119 females. The age is not usually given, but from conversations with physicians and my own observations I learn that a large proportion of the cases were in children.

In order that each fact brought out in this inquiry may be given its proper weight as a possible factor in the production of disease, it may be well here to make a brief statement of those facts in regard to the natural location and surroundings of the city, and of the customs and habits of its inhabitants, necessarily connected with its health history.

Louisville was first incorporated as a town by the Virginia Legislature in 1780, and as a city by the Kentucky Legislature in 1828. It is situated on the southern side of the "Falls of the Ohio," in latitude 38° 3′ and longitude 85° 30′. In 1830 it had a population of 10,341, which had steadily increased to 123,758 in 1880. The main portion of the city is built on an

alluvial plain, at an average of about fifty feet above low-water mark, and four hundred and forty-one feet above the level of the ocean. This plain is interrupted in the eastern and southern portion of the city by Beargrass Creek and its tributaries,

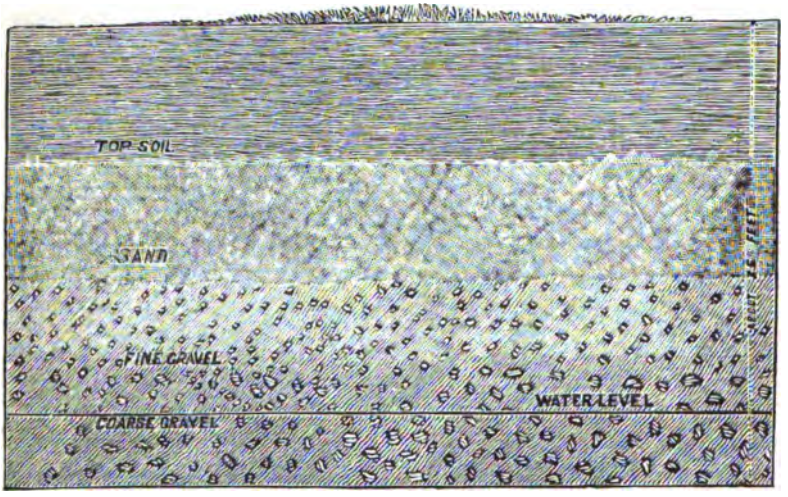

FIG. 1.

and south of the city is continuous with a district of swamplands several miles in extent. Much of the western, southwestern, and southern portion of the city was once studded over with stagnant ponds and marshes, many of the ponds being of considerable depth, and some of them still existing. These ponds were gradually filled with refuse from the city, usually without previous drainage, and over the surface thus filled a dense and often not overcleanly population has been crowded, with little or no provisions for preventing the further pollution of an already polluted soil. The character of the surface and subsoil formation is shown in Fig. 1, except that in many places the sand and gravel come much nearer the surface than the cut would indicate, and that the coarse gravel is usually not so near. The surface clay is mixed with sand, and on repeated tests I have found it quite porous. The subsoil is saturated with water under the entire city at a depth of from twenty-five to forty feet, as shown by the level at which water stands in the wells and privy-vaults. The dip of the under-

lying formation is from southeast to northwest, and the current or drift of this underground lake of soil-water, which furnishes a never-failing supply for the hundreds of wells, is always slowly flowing in this direction.

There are about eight hundred public wells in the city, of which five hundred are of brick and stone, sometimes lined with cement, as represented in Fig. 2; two hundred and fifty of cement, as represented in Fig. 3; and fifty tubular or bored

FIG. 2.

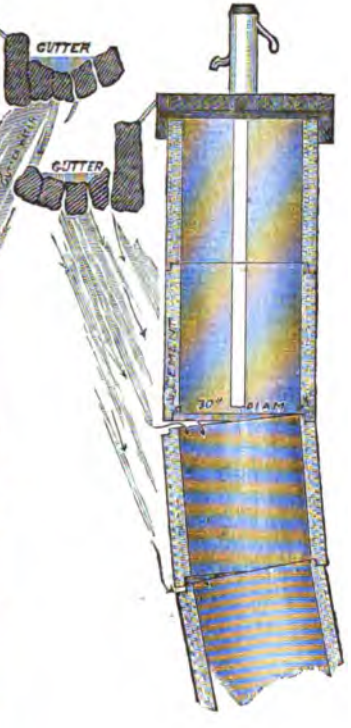

FIG. 3.

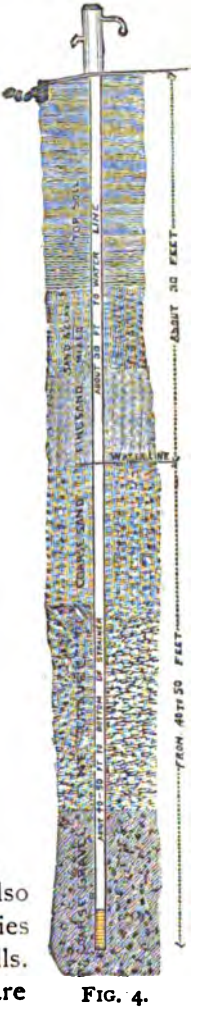

FIG. 4.

wells, as represented in Fig. 4. Figs. 2 and 3 also show some of the methods by which impurities from the gutters find their way into the wells. For the drawings from which these cuts are made, I am indebted to the city engineer, Mr. R. T. Scowden.

The brick and cement wells are from thirty-five to forty feet deep, and, as it is impossible for the men to work in water of a greater depth, they never extend more than four or five feet into the water-bearing stratum. In consequence of the sandy character of the soil, the banks are supported by wooden drums while the well is being dug, inside of which the brick wall is built. In sinking the cement wells no temporary drum is required. The tubular wells are seventy-five or more feet in depth. Nearly all the wells are located near the curbing, and are usually at the street corners, where the gutters intersect, and where the catch-basins are constructed. In very many instances depressions are to be found in the gutters in front of the pumps, filled with an offensive semi-liquid muck. By the kindness of Mr. Harlan, Superintendent of City Pumps, I examined one of the brick wells on the inside, and the same dirty fluid could be plainly seen trickling down the wall next to the gutter. Mr. Harlan informed me that this was common in all the old wells, and that he removed an average of from twelve to eighteen inches of muck from each of these wells every twelve or eighteen months.

The water-supply is from the Ohio River, supplied by the reservoir system, and from the public wells, of which there is one for almost every square. The intake for the water-works is at a safe distance above the city, and samples Nos. 1 and 2 in the table shows the result of the chemical and microscopical examinations of this water at different stages of the river. The large amount of vegetable matter held in suspension causes it to rank low in the chemical analysis, but the small amount of chlorine and the absence of nitrites and free ammonia are favorable to it, and the result of the microscopical examination is still more so.

In addition to the danger from direct see page from the gutters, there is a greater danger of contamination of these wells from the surrounding soil. Every well may be said to drain a circumjacent region, which may be represented as an inverted cone, with its apex at the bottom of the well and its base at the surface of the ground, as shown in Fig. 5. The diameter of the base will depend on the depth of the well and character of the soil, and here would probably be from one hundred to two hundred feet. In most instances, such an area would in-

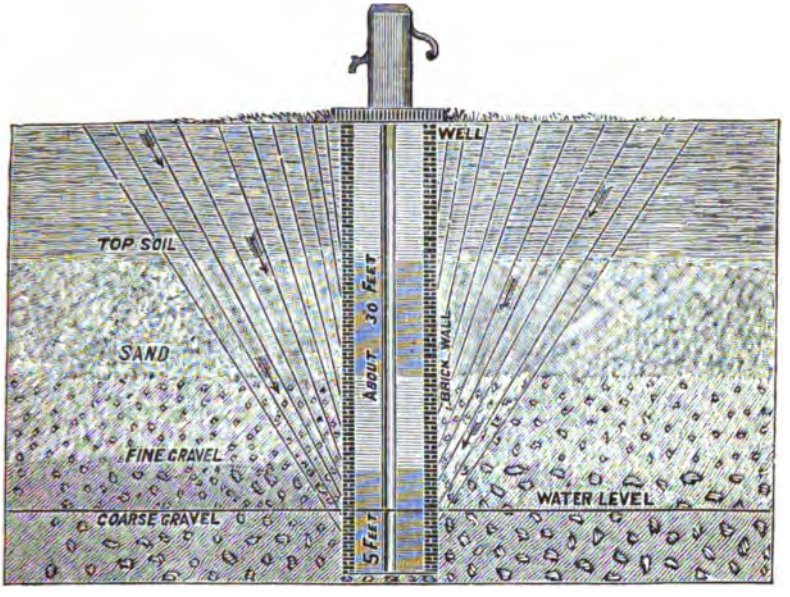

FIG. 5.

clude several vaults, cess-pits, foul back yards, alleys, and other sources of filth. The following forcible and instructive instance of the fouling of wells from a source above their level is quoted from the report of Mr. Child, officer of health for certain districts in Oxfordshire, England :

" In consequence of the escape of the contents of a barrel of petroleum, or benzoline, which had been buried in an orchard, a circuit of wells sixty feet below, and two hundred and fifty or three hundred yards distant, became so affected that the occupiers of fifteen houses, containing eighty-two inhabitants, were for ten days unable to use the water for drinking or cooking. The cattle of one of the proprietors, moreover, refused to drink at the spring where they were accustomed to drink. Had this soakage been sewage, instead of petroleum, who can doubt that the result might have been wholesale water poisoning, and an outbreak of typhoid fever ? "

The accompanying tables give the result of the chemical and microscopical examination of water from the several kinds of wells described, as well as the river water :

CHEMICAL EXAMINATION OF THE DRINKING-WATERS OF LOUISVILLE, BY J. A. TANNER, M. D.

Number.	Location.	Time of Collection.	Odor.	Turbidity.	Chlorine. Grains per Gallon.	Nitrites. Parts per 1,000,000.	Ammonia. Parts per 1,000,000. Free.	Ammonia. Parts per 1,000,000. Albuminoid.	Class of Water According to Wanklyn.	Remarks.
1	River water	Low water.	None.	Slight.	1.50	.000	.000	.100	Class II.	
2	River water	Med. high water.	None.	Turbid.	.75	.000	.060	.130	Class III.	The small amount of chlorine and absence of nitrites indicate vegetable matter.
3	Well cor. 5th and York	Rained the morning of collection.	None.	Little sed.	4.00	.000	.000	.050	Class I.	
4	Well cor. 8th and Chestnut		None.	Clear.	5.00	.200	.026	.080	Class II.	The presence of nitrites renders this water suspicious.
5	Well cor. 5th and Jefferson		None.	Clear.	6.50	Trace.	.000	.090	Class II.	
6	Well cor. 6th and Jefferson		None.	Clear.	2.50	.040	.026	.080	Class II.	Free ammonia and nitrites are present and point to suspicious pollution.
7	Well cor. 13th and Grayson		None.	Clear.	6.75	.200	.026	.130	Class III.	Water of a dangerous character.
8	Well cor. 16th and High	Rained the night previous to collection.	Disagr'ble	Smoky.	10.50	.100	5.332	.190	Class III.	Should be condemned absolutely.
9	Well cor. 19th and Portland		Disagr'ble	Smoky.	11.00	.100	.026	.210	Class III.	Should be condemned absolutely.
10	Well cor. 18th and High		None.	Clear.	5.00	.000	.000	.060	Class II.	
11	Well cor. 18th and Lytle		None.	Clear.	9.00	.020	.013	.070	Class II.	The presence of such a large amount of chlorine, nitrites, and free ammonia is suspicious.
12	Well cor. 17th and Rowan	Rained two days previous to collection.	None.	Clear.	4.00	Trace.	.000	.080	Class II.	
13	Well cor. 16th and Lytle		None.	Clear.	7.00	.200	.052	.100	Class III.	Water of a dangerous character.
14	Well cor. 18th and Bank		None.	Clear.	3.00	Trace.	.026	.060	Class II.	
15	Well cor. 17th and Tyler		None.	Clear.	10.00	.100	.000	.050	Class I.	Ammonia is small in amount; excess of chlorine and presence of nitrites render this water suspicious.
16	Well cor. 16th and Bank	Rain'd sev'l days before collect'n.	None.	Clear.	4.50	.100	.400	.110	Class III.	Water of a dangerous character.
17	Well cor. 3d and Market §		None.	Clear.	4.60	.100	.032	.034	Class I.	Suspicious.
18	Well cor. 9th and Jefferson §		None.	Clear.	4.50	.000	.030	.013	Class I.	

§ Tubular.

Wanklyn classifies water as follows: Class I. Water of more than ordinary organic purity, yielding from .00 up to .05 part of albuminoid ammonia per 1,000,000 parts of water. Class II. General drinking-waters, safe organically, yielding from .05 up to .10 part of albuminoid ammonia per 1,000,000 parts of water. Class III. Dirty waters, yielding from .10 and upward of albuminoid ammonia per 1,000,000 parts of water.

To report upon the character of a drinking-water from chemical examination alone, as to the water being safe or unsafe, is not always possible. In the thorough investigation carried out by the National Board of Health, in the year 1880, this fact was clearly demonstrated. In this examination, waters that were undoubtedly suspicious, as shown by their histories, gave but little organic matter on chemical examination, and were pronounced safe by the analysis according to the classification of the process used. While this was true, the examination also showed that in pure waters nitrites were absent, or present only in trace, but in waters known to have carried disease the nitrites were almost invariably present; hence, it is safe to look with suspicion upon any water collected where pollution is to be expected, on account of the location, which gives more than a trace of nitrites. Accordingly, after stating the class of the water according to the main process used by me, I have added remarks based upon the presence of nitrites and chlorine. The presence of chlorine in water, in a large quantity, is always suspicious. J. A. TANNER, M.D.

(The table of Microscopical Examination is omitted for want of space. The results correspond with the chemical analysis; those samples designated as containing nitrites or ammonia, and those marked dangerous and recommended to be condemned by the chemical analysis were, without exception, found by the microscope also to present dangerous qualities.—EDITOR.)

The first samples were all taken between December 3 and December 16, 1884. The second samples were collected during the month of January, 1885. Microzymes are alone subject to cultivation in the manner indicated above. These are all indicative of putrid matters highly prejudicial to health. Intermittent, relapsing, and continued fevers, diphtheria, dys-

entery, and enteric diseases are likely to follow the use of the waters yielding culture products.

Fourteen cases of fever are reported in families who used the water from well No. 15, 14 from No. 16, 13 from No. 10, 8 from No. 9, 7 from No. 12, and so on in lesser numbers throughout the list, there being few wells in this quarter of the city from which cases are not reported.

Sewers have been constructed very generally in the central portion of the city, but house connections are not enforced, and when made are under little or no official supervision, the connections being left largely to the caprice of the owner and the honesty of the plumber. There are some sewers in the western portion of the city, but these have few house-connections, and even in other portions of the city where house-connections are had it is a common custom to have privy-vaults in the yard for servants; in all other sections the vault system is relied upon by a large majority of the inhabitants. These vaults are sunk inside the wooden drums, as was mentioned in describing the wells, and then walled with brick, the drum being left to decay. They always extend to the gravel formation, from twenty to thirty feet—for the express purpose, as I was informed by the officials, contractors, physicians, housewives, and all others with whom I conversed on the subject, that the liquid portion of the contents might drain off into the sand and gravel. From what I could see and learn, the ordinances regulating the cleansing of the vaults receive but little attention from either householders or the authorities, and this was especially noticeable in most of those examined by me in the fever districts. The usual location of the vaults is shown on the map by dotted lines running through the centre of the squares, but in many instances they are much nearer the wells, and in one—corner of Grayson and Thirteenth Streets, No. 7, in the table of analysis—which supplies the drinking-water for a public school with six hundred and fifty pupils, as well as the immediate community, the female and male vaults for the school are respectively thirty-six and seventy-six feet from the well. In a large number of houses in the better quarters of the city, where water-closets are constructed inside the houses, these, with the bath-rooms and kitchen-sinks, discharge their contents into "dry-wells" in the yard or cellar. These dry-

wells are constructed in the same manner as the vaults, are usually closely covered, and often have no ventilation except back through the drain into the house. It would be difficult to imagine anything more dangerous to health than these contrivances.

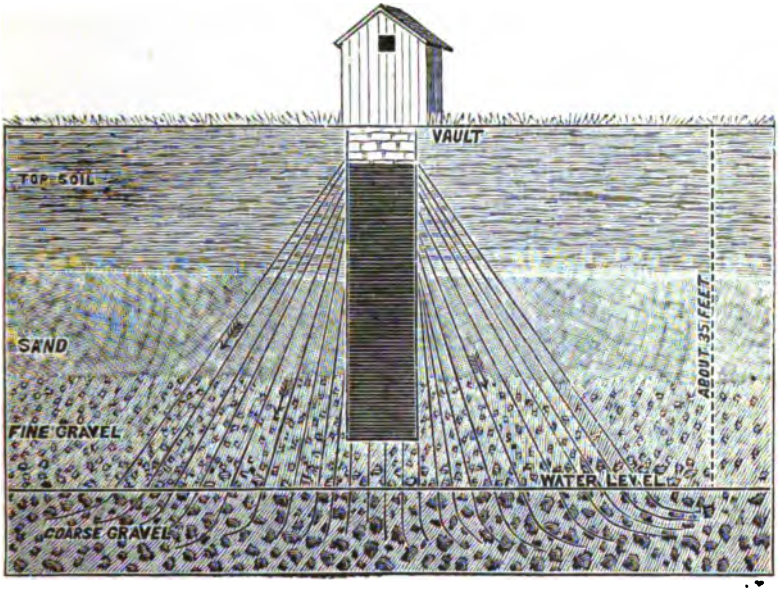

FIG. 6.

The ordinary way in which the contents of vaults and other receptacles of filth may find their way into the wells is shown by Fig. 6. Here the apex of the cone is at the surface of the filth, and the base at the water level, or an impermeable stratum. In a soil of great porosity, such as we have here, with the wells and vaults in close proximity, it is easy to imagine the lines of filtration in Fig. 5, and those of pollution in Fig. 6 interlacing in the water of the wells; and that this is no imaginary picture is shown by the analysis of the water, and to the thoughtful physician still more clearly by the high death-rate from filth diseases among those who use this water. It has been before stated that under the entire city there exists a sort of underground lake flowing slowly to the northwest. A well sunk to a distance of from thirty-five to forty feet at almost any corner furnishes an abundant supply of water from this

lake, and from thirty-five to fifty vaults sunk almost to the same level in every quarter utilizes the same body of water in carrying off their foul contents. In this way thousands of gallons of urine and liquid feces are daily poured into the source of the water-supply, and, as this contamination begins at the southern limits of the city, it would naturally become greater as it passes under it, the wells near the river in the northwestern portion being the foulest. In the main, this theoretical view seems to be sustained by the examination of the water, and the prevalence of the fever during the past year, but more extended observations on this point will be necessary to settle this question. It is often urged that the soil is a sufficient filter to prevent this pollution of the water, but when it is remembered how soon an ordinary filter becomes fouled from the passage of water through it not especially impure, and then the quantity of concentrated filth which has been poured into the porous soil under this city for the past hundred years, it will be seen how little reliance can be placed on this natural filter. No doubt it still acts as a strainer, keeping back solid material, but affording little protection against soluble substances.

Among the wealthier classes in the central portion of the city kitchen slops and garbage are probably properly disposed of with a majority, but in the unsewered districts the usual practice is to throw or drain the house-refuse into the alleys, gutters, or vaults. In a great many instances shallow trenches for this purpose extend from near the kitchen door to the alley, or around the side of the house to the gutter. In many of the alleys I noticed that the hogs had made extensive wallows, into which the slops and garbage were thrown. If the picture here drawn is an unpleasant one, the people who have made it, and particularly the city authorities who have tolerated and even fostered the "system" and habits which have made it possible, must be blamed.

These, in brief, are the facts as I gather them. In a location naturally malarious, and where the strictly malarious diseases still constitute a very considerable part of the sickness, owing to defective drainage and an impure water-supply, we have added the filthy anti-hygienic conditions found in all flat, unsewered towns, and the natural consequence, a high death-rate from what are now known as filth diseases. Thus we see

that in ten years there were 1,980 deaths from diarrhœal diseases, 346 from scarlet fever, 217 from diphtheria, and 977 from typhoid fever—3,521 deaths from preventable filth diseases. In the light of these instructive, if not pleasant historical facts and surroundings, and of our own investigations, we are to look for the cause of the recent endemic of fever. Typical unhealthy conditions are found on all sides. Leaking vaults or dry wells—a system long since condemned by sanitarians—are found in the rear of most houses, and the exhalations and drainage from these and from the polluted surface soil constantly befoul the atmosphere and water. An analysis of the water used by most of the families in which the disease occurs shows it to be contaminated with organic matter, and under the microscope it is found to be teeming with the lower forms of organic life. The disease is found to be most frequent where the water would naturally be foulest, and in the fall season, when the water is lowest and most concentrated, and where the bad sanitary conditions are most abundant. It also occurs in a few cases where hydrant water is used, and in some houses where the sanitary surroundings are apparently the best. Can we explain these exceptional cases with our present information? No, although special inquiry in each case would, no doubt, usually show a dry well, defective drain, foul cellar, or impure emanations from neighboring premises; for it may be laid down as a rule that this order of disease only occurs in the presence of sanitary defects. As might be expected from the difficulties naturally surrounding the question, a variety of opinions was found to exist among the physicians as to the exact character of the disease. To these opinions, and especially to the symptoms upon which they were based, I have given most careful attention. Starting out in the investigation with no preconceived notions, and with no theory to sustain as to the character or cause of the disease, I am inclined to the opinion, after weighing all the testimony, that it is not specific typhoid fever, but a mongrel type of non-specific fever, produced by the combined influence of filth and malaria —the typho-malarial fever of Woodward, and the continued malarial fever of Loomis. In the later stages of severe and fatal cases, what are known as "typhoid symptoms" were often well-marked, as they usually are after a long-continued

high temperature from any cause, but in a majority of cases few of the distinctive features of typhoid fever were present, and, so far as I can learn, the entire endemic furnished few cases in which there was, from the outset, that peculiar group of symptoms which should have been commonly present in an outbreak of that disease in the midst of such unfavorable sanitary surroundings. The mild character and short duration of most of the cases, and the large proportion of females and children attacked, taken with the prevalence of malaria, which seems to be antagonistic to typhoid fever germs, argue strongly in the same direction.

This, however, is a question of scientific rather than practical interest. Whether or not the polluted water and the exhalations from ponds, vaults, cellars, yards, and alleys produce the disease by their own foulness, or were the hot-beds for the development of the disease germs from ordinarily harmless organisms, or for the reception and multiplication of specific germs from a previous case, are questions which may well be left to the future, as their determination will give us little practical assistance. In any event these conditions are essential to the prevalence of such diseases, and, what is of equal importance, they lower the vital resistance to, and largely increase the mortality from, all kinds of sickness; and their removal or abatement becomes a necessity if the train of evils which has attended them here and elsewhere is to be avoided. If space permitted I might give the history of scores of cities, in this and other countries, to show the relations between these conditions and the prevalence of such diseases. A few will suffice. In an address delivered before the Fifth Congress of the Sanitary Institute of Great Britain, Douglass Galton said:

"It may be accepted as certain that in every case where the sewerage of towns has been devised on sound principles, and where the works have been carried on under intelligent supervision, a largely reduced death-rate has invariably followed. The records of Newcastle afford evidence of this fact. The quinquennial period beginning in 1868 showed a death-rate of 27.6. The quinquennial period ending in 1881 showed a death-rate of 23.0, while the death-rate of 1881 was only 21.7.

Munich is the residence of one of the ablest sanitarians of Europe, Dr. Pettenkofer. His admirable illustrations of the

effects of the impurities which are accumulated in porous cess-pits upon the air of the town, and the death-rate of the population form a text-book of sanitary knowledge.

At Munich the entire fever mortality per million inhabitants for quinquennial periods was as follows: In 1854 to 1859, when there were absolutely no regulations for keeping the soil clean, 24.2; 1860 to 1865, when reforms were begun by cementing the sides and bottoms of porous cess-pits, 16.8; 1866 to 1873, where there was partial sewerage, 13.3; 1876 to 1884, when sewerage was complete, 8.7.

Similarly, at Frankfort-on-the-Main, the deaths from enteric fever per 10,000 were: 1854 to 1859, when there was no sewerage, 8.7; 1875 to 1880, when sewerage was complete, 2.4.

At Dantzic the figures present some more striking characteristics; the deaths from enteric fever per 10,000 living were as follows: 1865 to 1869, when there was no sewerage and no proper water-supply, 108; 1871 to 1875, after the introduction of a water-supply, 90; 1876 to 1880, after the introduction of sewerage, 18.

In Hamburg the deaths from enteric fever per 1,000 of total deaths were: From 1838 to 1844, before the commencement of any sewerage works, 48.5; from 1871 to 1880, after the completing of the works, 13.3. During the time that the works were in progress, viz.: from 1872 to 1874, the mortality from enteric fever per 10,000 living was, in the unsewered districts, 40.0; in the districts for the most part sewered, 32.0, and in the fully sewered districts, 26.8.

These results illustrate the effect of purifying the air of towns by the rapid abstraction of refuse matter, so as to prevent it from remaining and putrefying in and upon the ground.

It may be suggested that the contents of cess-pools can be removed by carts as well as the contents of the vaults.

The pump-water began to attract attention as a cause of this class of diseases in Brooklyn in 1878. The relation was not more direct than I have been able to show here, but the water of one after another of the wells has been subjected to a rigid analysis and condemned, until six hundred and fifty-three of six hundred and fifty-five wells in the city have been filled, and one of the two remaining is now under condemnation. The advantages to health in Brooklyn have not been less marked

than the instances quoted by Captain Galton. A similar, though less vigorous, course has been pursued in New York, the use of well-water for domestic purposes has been forbidden, and over one thousand privy vaults have been ordered closed within the last month.

Memphis, in its pre-epidemic days, presented conditions very similar to those found here. After suffering a high death-rate for years from the ordinary forms of filth diseases, it required one epidemic of cholera and two of yellow fever to convince them that their water was foul and their general unsanitary condition a disgrace. It remains to be seen whether Louisville will wait for further lessons in the school of experience, or profit by that already had at home and seen abroad. It would ordinarily require strong faith to feel hopeful on this subject about a city which, in 1881 (which may be taken as a fair sample year), spent $150,000 for its fire department, $118,000 for its police department, and $1,600 for its health department; but with a reform mayor, who seems to fully appreciate every interest he has been appointed to guard, the public health will doubtless receive attention.

As to the remedies for these defects, it is only our province to suggest: *First*, the city health department should have a competent analyst, who should frequently and rigidly examine the water from each of the wells, and those found contaminated should be condemned and filled. By filtration, sedimentation, and every other available means, the water-supply from the Ohio River should be improved. Sewers should be constructed much more rapidly than in the past; and where they do exist, every house should be required to connect with them, and all plumbing should be under the supervision of a competent inspector. All existing vaults and dry wells should be condemned, cleaned, and filled, and the construction of new ones forbidden, or required to be water-tight. When sewers do not exist some form of dry-earth closet should take the place of the vaults, the contents being deodorized with cinders, ashes, or dry clay, and the filled buckets carted away at stated intervals, to be made into compost and sold for fertilizing purposes. This system has long been in satisfactory use in Manchester and other cities in England, as well as in this country, and can be worked at an average cost of two dollars and sixty cents for each family.

All garbage should be cremated in the kitchen range and carted away. Physicians should be required to report to the health officer, by postal cards provided for that purpose, every case of communicable disease to which they are called, and prompt action should be taken by that officer, acting in concert with the family physician, to prevent the spread of the same. Less so-called professional dignity and contention about meaningless medical etiquette, and more true humanity should govern physicians in the future in regard to reporting and preventing the spread of communicable diseases.

Such organized work presupposes the existence of a Board of Health for the city provided with both the power and the means for protecting the interests intrusted to it. In the past Louisville seems to have been unfortunate in this respect. With an accomplished physician for its health officer—as I understand has usually been the case—and with a Board of Health taken from the better class of physicians and leading city officials, it can discharge but few of the functions of a health board, because the powers intrusted to it are scarcely nominal, and the funds appropriated to it are too small for any useful work. The Board of Health should have ample power and money enough for its legitimate expenses and investigations, and then be held to a strict accountability. These remedies are not suggested as experiments, but are such as have been thoroughly tested and approved in other cities. Their adoption would cost money, but Louisville must either spend money to improve its sanitary condition, or its citizens must spend it in caring for the preventable sickness and unnecessary deaths of its inhabitants, since several hundred deaths and an average of probably not less than ten cases of sickness for each death occur here every year from preventable causes. The cost of this sickness, and the immense money value of the time and labor lost, as well as the money value of those who die, are as certainly a tax on the citizens of this city as though it was collected by the tax-receiver instead of the doctors, druggists, nurses, and undertakers. The smallest epidemic of cholera would cost more to the city, indirectly, in loss of trade and good name, than would make all the improvements I have indicated; yet all the conditions are here to invite the location and cause the spread of cholera.

The police and fire departments each have an annual appropriation of more than $100,000. Modern sanitary science has demonstrated that a proper enforcement of wise health measures will diminish sickness just as surely as a police and fire department will lessen crime and limit fires. Let the people once fully understand this and the money part of the trouble will be ended, as has been the case in Detroit, Milwaukee, and other cities.

These suggestions have reference to the duties of the city government. Duties no less evident or important remain for individual citizens; for in health matters, as in religion, each individual and each household has duties to perform which cannot be left to others. There are probably few houses in the city without defects in the ventilation, heating, or drainage, which, detected or undetected, are impairing the health or lowering the vitality of its occupants. In the construction of most of them every other question has received more consideration than this, because few people have been instructed as to the importance or methods of preserving health. If the head of the household were told that his family were taking in some special poison in their daily food, he would be greatly alarmed and have a rigid investigation made. Why should he be less so because they drink it in from a polluted well, or breathe it in from a foul sewer, dry-well, or cellar?

A thousand of the leading business men of Louisville could no better employ a small part of their time and means than in following the example of Glasgow, Edinburgh, Newport, and Lynn, as New Orleans and St. Louis have recently done, in organizing a Sanitary Protective Association for mutual defence against disease, and for spreading information among the people in regard to the plain laws of health. Small annual dues from each member would create a fund for the employment of an inspector to make monthly visits to the house of each member and point out and suggest the remedies for any dangers to health found to exist. Such an organization would be a stimulus and help to the health department. In spite of all that is said to the contrary, my own experience has convinced me that there is no other subject about which people are so anxious to learn, or where they take so much pride in the little knowledge they do possess, as in regard to disease;

and a society of this kind, aided as it would be by the press and other educational agencies, which would naturally associate themselves with it, would soon bring about a lasting health reform in Louisville.

No one is more conscious of the incompleteness of this report than myself. Pressed by other duties and hampered by want of funds for necessary investigation, this much has only been possible through the assistance of Drs. Clemens, Bailey, Galt, Kelch, Holland, Pelle, Roberts, McDonough, Allen, Taylor, Grant, Beutel, Rademaker, Simpson, Berry, Parsons, Brandies, Griffiths, Garr, Mills, Marshall, Murrell, Gilbert, Doherty, Leber, Satterwhite, Larrabee, Bland, Hoskins, Reynolds, and Tanner, and Messrs. Davis, Scowden, Garriott, Duffy, and Harlan; and to each and all of whom I now return my sincere thanks.

THE AMERICAN CLIMATOLOGICAL ASSOCIATION.*

A YEAR ago, at the instance of a number of prominent physicians, a Society was organized, just before the meeting of the American Medical Association at Washington, for the purpose of studying the relations of climate to therapeutics, and of establishing more definitely the real value of health-resorts in the treatment of disease. It was natural that such an organization should attract more especially those who are called upon to treat diseases of the respiratory apparatus, as it is for patients of this class that a change of climate is most frequently prescribed. The papers read at the first meeting were, therefore, devoted to the consideration of the relations of climate to diseases of the air-passages, and especially of phthisis pulmonalis. At the present session the essays were of wider range and in greater number, giving evidence of strength and vitality in the young organization which promises a useful career.

The sessions this year extended over two days. They were held in New York, at the Academy of Medicine; Prof. A. L. Loomis, M.D., President of the Association, occupying the chair.

* From Philadelphia *Medical Times Report.*

The first business, after calling the session to order, on Wednesday afternoon, May 27, was the

ADDRESS OF THE PRESIDENT.

The object of the organization of the Association had been stated to be "that representative medical men of different sections might come together, and from their different views and experiences endeavor to determine the therapeutic value of the various localities which have been claimed to have the power of arresting or curing chronic disease of the respiratory organs, and to discuss their etiology, pathology, and treatment." The diseases of the vascular system and the therapeutic value of our mineral springs were also, in his opinion, accessory subjects worthy the attention of the Association. The study of sanitation and appropriate health-resorts for different chronic disorders, he thought, had been too much neglected. Through properly-organized committees the Association might determine the real merits of the various health-resorts which at present and may in the future claim patronage and support. It should endeavor to place those that are found worthy of its endorsement under the supervision of intelligent physicians, who, by the aid of local authorities and perhaps by legislative enactment, may render them more efficient for the cure of those diseases to which they are especially adapted. He referred for illustration of the usefulness of such wise administration to the Adirondack Cottage Sanitarium, under Dr. E. L. Trudeau, situated near Saranac Lake Village. It is an attempt to put within the reach of patients of moderate means, suffering with pulmonary disease, the benefits to be derived from the Adirondack climate. The cottage plan has been adopted, the small buildings being clustered around a commodious main building, where the food is served. The advantages of this Sanitarium were considered in detail, taken from Dr. Trudeau's report.

As the subject proper for the address the President named "The Influence of the Recent Views of the Etiology and Morbid Anatomy of Pulmonary Phthisis on its Climatic Treatment."

Three distinct views of the etiology and morbid anatomy of phthisis prevail at the present time :

1. It is an inflammation of pulmonary substance which may or may not be complicated with tubercle.

2. Tubercle is the primary and essential lesion of all phthisis.

3. It is constituted by the presence of a specific material, which may or may not be accompanied by the histological elements of tubercle, but which always has a specific form of bacillus as the sole exciting cause of its development.

Whatever conclusions may finally be reached as to the exact nature and cause of phthisical processes, he said that clinically we must always recognize two varieties of phthisis :

(1.) *Acute Phthisis*, the morbid changes of which are a complex of inflammation and the rapid development of tubercular tissue in the lung-substance.

(2.) *Chronic Phthisis*, the essential pathological character of which is consolidation and induration of lung-substance; tubercle may or may not be its primary lesion, but it is usually present in its advanced stages. During the past two years his own examinations of the lungs of those who had died with the clinical history of chronic phthisis have convinced him that in advanced phthisical processes tubercular tissue can always be found, but he was not prepared to state that the development of tubercle is the primary lesion in all or in the majority of cases. In very many he is confident that a non-specific infiltration of the lung precedes tubercular invasion and furnishes suitable soil for the development of tubercle, as well as for the growth and multiplication of tubercle-bacilli when present. Koch's claim "that the repeated entrance into healthy lungs of small numbers of the specific bacilli of tuberculosis will cause chronic phthisis, and that the simultaneous admission of numerous bacilli will produce acute phthisis," stands as yet unproved.

If phthisis have its origin in an infection, it seems evident, from a clinical as well as a pathological standpoint, that certain preparatory tissue-changes must take place in the lungs before the infection can be received, or, in other words, before bacillary invasion can take hold and become effective for evil. Both experiment and observation seem to show that these bacilli, whether developed inside or outside the body, cannot thrive unless certain conditions are present.

All pathological speculations must be brought to the crucial

test of clinical experience; the facts drawn from direct observation must not be allowed to be warped or strained in the slightest degree. By this standard there are three factors which may be regarded as preparatory to the phthisical infection, if such infection shall be found to exist:

First. A state of constitutional feebleness, either inherited or acquired, which diminishes the resisting power of the individual, and renders him abnormally susceptible to diseased processes.

Second. A condition of the upper portion of the lungs, brought on by feebleness and slowing of the circulation, which favors the development of diseased processes.

Third. The establishment of localized inflammatory processes in the bronchi, lung-substance, or pleura.

He believed that no one will question the statement that the treatment of phthisis which is to-day attended by the best results is that which has for its object the invigoration by every means possible of the general health, and the avoidance of those conditions which predispose or favor local pulmonary inflammation.

An appeal to clinical medicine for the means of fulfilling these therapeutical indications is answered by "good hygiene, good food, and suitable climate, and those medicinal agents which promote and maintain that normal performance of the digestive and assimilative processes which are essential to healthy nutrition."

The most essential of these is suitable climate, which acts by its invigorating effects upon the general system, and, secondly, by its local effects on diseased lungs in preventing and arresting diseased processes. The essential requisite factor of a good climate is pure air. As pointed out by Jaccoud, there are many points to be considered in discussing the availability of a certain climate other than those which can be found in meteorological tables. Diversity of opinion exists as to the principal feature to be studied in climatology of health-resorts, but the lecturer believed that "purity of atmosphere and consequent freedom from germs" seems to offer a more satisfactory solution of this problem than any other which has been suggested. In the presence or absence of these organisms is to be found an explanation of the therapeutical differences in the

air of different localities. Sir John Lubbock, in his address before the British Medical Association, stated that the smallest sphere of organic matter which can be distinctly defined by the microscope is about 1–180,000 of an inch in diameter, and a particle of this size would contain many millions of molecules which may be the germs of organic life. Such a thought opens a wide field for the origin of the microbes of disease, even when we shall have become familiar with the different species of every known infection.

Referring to Professor Tyndale's observations upon atmospheric germs of living organisms, and to the statement of Dr. Andrews that "the micro-organism which excites phthisis, whatever it may be, at certain altitudes is no longer met with," he was led to the observation that purity of atmosphere is the essential therapeutic agency in high latitudes. All elevated regions do not furnish it, however.

Another climatic condition, of great importance, and as essential as altitude to the purity of the atmosphere, is *porosity of the soil.* Dr. Bowditch originally called attention to this in 1862, and Dr. Buchanan, in his report to the Privy Council, confirms the statement that *dampness* of the soil is one of the most prolific causes of phthisis to the inhabitants living upon it.

The presence of extensive evergreen forests has been found to have a powerful purifying effect upon the surrounding air. Winds, on the contrary, are prejudicial to the consumptive.

Ozone and atmospheric electricity are elements in the local climatology of health-resorts which deserve careful study: they doubtless have much to do with the therapeutic effects obtained by change of residence.

In conclusion, he considered the state of the patient, and warned against sending patients away from home who were already too ill to be benefited. Hyper-excitability of nervous system, much febrile movement, or serious organic involvement would forbid such a change. There are many who would be injured by the fatigue of travel more than they would be benefited by the climate.

ANTISEPTIC INHALATIONS.

Dr. BEVERLY ROBINSON read a paper recommending antiseptic inhalations in the treatment of chronic bronchitis and

phthisis, and exhibited a simple form of inhaler made of perforated zinc, which was cheap, clean, and efficient. The apparatus covered the mouth and nose, and contained an apartment for cotton saturated with the medicament. The inhaler could be worn from half an hour to several hours daily, or all night if desired. The following points in favor of this method of treatment were cited:

1. The apparatus required costs but a trifle, and, therefore, may be used even by the poorest classes. 2. Medication thus applied may be employed under circumstances where the use of hot or cold sprays is impracticable. 3. There are no risks of future colds attendant upon its employment. 4. The relief afforded by dry-vapor inhalations was, in his experience, frequently greater than that given by the other methods of inhalation. 5. This medication is well adapted to all forms of irritative disease of the respiratory passages.

The only objection that can be urged against their use is want of efficiency of the ordinary form of inhaler, with which the medicated vapors do not pass deeply enough into the pulmonary cells to modify their structure to any sensible degree. To the objection of Dr. A. Hill Hassall (*Lancet*, March 5, 1883) that "the substances used are not very volatile, and that only an inconsiderable amount, if any, enters the lungs," the statements of patients were given as a set-off: not only were patients improved in health, but they also noticed a change in the appearance of the sputa and a reduction in their quantity. Vapors certainly penetrate more deeply than the sprays, for which they have been substituted. He was also of the opinion that the small amount of substance which was not recovered in Dr. Hassall's experiments, and which *possibly* does penetrate the pulmonary air-cells, is sufficient to modify notably, after several days or weeks of more or less continued inhalation, the inspired air in such a manner that it is made comparatively aseptic, and thus we have an influence for good that we can properly estimate only by the evident effects produced. According to the lecturer's observations, pulmonary cough is largely due to irritation produced at the apices, reflex in character.

Dry inhalations were introduced by Dr. N. N. Roberts, of Manchester, England, and were afterward used by Dr. H.

Curschmann, of Hamburg, William Pepper, J. Solis Cohen, and others. His own experience embraced twenty-three cases (of which he had kept records) of *primary catarrhal or tubercular phthisis*. In four of them there were marked pleuritic adhesions. In the remaining cases no statement is made other than the fact that pulmonary consolidation at the apex or apices was present. Nineteen cases of *catarrhal or tubercular phthisis in the second stage* were treated partly by oro-nasal inhalers. Of these, eleven had one-sided softening, in two both apices were affected.

There were six cases of *fibroid phthisis* treated by inhalers, and three cases of *laryngeal phthisis*, in one of which there was commencing carious ulceration of the vocal cords. There were two cases of acute, seven of subacute, and three of chronic, laryngitis, with cases of bronchitis, two acute and three chronic; and five cases of chronic nasal catarrh, with one case of pharyngitis and two of localized pleurisy, and one of paralysis of the tensors of the vocal cords,—making seventy-six cases in all, which were the basis of the present paper.

The results of his observations seemed to show that the most generally useful inhalation in the beginning of pulmonary phthisis is creasote and alcohol (equal parts). The amount is about ten to twenty drops, used two to three times in the twenty-four hours, dropped upon the sponge of the zinc perforated inhaler. The time of inhalation was gradually extended to fifteen minutes; more than this caused irritation and cough. The form of inhaler was like that of Burney Yeo, of London, or S. S. Cohen of Philadelphia. He described the various forms of inhalers in use, and pointed out some advantages, and spoke approvingly of the simple shield of perforated zinc provided with a small sponge for holding the medicament. He suggested (1) that the holes should be made large, so as to admit air more freely; (2) the posterior half of the inhaler not to be perforated at all, but to consist of one uniform piece on each side; (3) a double valve arrangement to allow the expired air a ready exit from the inhaler without passing again through the sponge. With these modifications the inhaler might be made so as to be worn both day and night, almost continuously.

The general treatment of his patients was malt and cod-liver oil, compound syrup of hypophosphites, and iron and arsenic.

He also used counter-irritation, digitalis, quinine, stimulants, and good food. As these remedies had been faithfully tried before without benefit, he could only attribute the subsequent difference in the effects of treatment to the antiseptic inhalations.

The histories and results of a number of illustrative cases were communicated, showing admirable effects for this plan of treatment in ameliorating symptoms in some cases, and arresting disease in others.

DISCUSSION.

Dr. F. C. SHATTUCK, of Boston, in opening the discussion, said that he had not been able to observe very decided results from his own trial of this method, and had found it difficult to keep up. The reported influence in relieving cough, however, he thought warranted the use of the inhaler, for it is a great desideratum to have the cough properly held in check, especially when it can be done without administering remedies by the stomach, and thus disturbing digestion and appetite.

Dr. WESTBROOK thought that the good results of the treatment might be ascribed (1) to the uniform temperature and moisture of the air passing through the inhaler, and (2) to the balsamic vapors, which have a very soothing effect upon the mucous membrane when supplied for a long time. This is shown in relieving the irritability of the larynx and reducing cough, and the benefit in chronic bronchitis and phthisis may be ascribed to this source. He noticed that the lecturer did not use this alone, but also relied upon constitutional treatment by cod-liver oil, malt, etc. The inhalation lessens irritability of upper air-passages, reduces the amount of secretion, and gives the patient rest. He did not think that facts would warrant the statement that more cough attends disease of the apex than lower down in the lung.

The PRESIDENT stated that cough in phthisis, especially the violent paroxysmal attacks of coughing, is very largely due to pleuritic changes, and these pleuritic adhesions are more likely to occur in the upper part of the lung. Often they cannot be detected by examination of the lungs. Inhalations do good as anodynes to the air-passages, especially moist inhalations. He cautioned against the use of strong inhalations, as they might

cause irritation. He had seen hemorrhages after such inhalations, but did not attribute the hemorrhage to the inhalation: he noticed it as a coincidence.

Dr. ROBINSON, in reply to a question from Dr. Reed, said that he had used ether both alone and in combination with balsams, but found it irritating, and prefers chloroform (gtt. ij.). He believed that the vapor entered the air-cells, on account of the changed and diminished secretions. The principal object is to make the air inhaled as pure as possible. If the patient cannot get to the mountains, the mountain-air must be brought to the patient. He reiterated the statement that cough is more frequent when the apex is involved than in affections of other portions of the lung. He could not accept the view that pleuritic adhesions are the common cause of cough; he had not found it so post-mortem; and, moreover, if the cough had such an organic cause it would not subside so quickly as it does when the patient goes to the mountains from the city.

Dr. W. C. JARVIS, of New York, read a paper entitled

CATARRHAL AFFECTIONS OF THE NASAL CAVITIES AS A CAUSE OF PULMONARY PHTHISIS.

After describing the anatomy of the parts and the effects of imperfect drainage of the nasal sinews, he announced the following conclusions:

In determining the relations of nasal catarrh to pulmonary phthisis, he had, in the order of its origin and sequence, commenced by observing and interpreting the catarrhal manifestations as they occur in the nares, and had traced the gradual extension of the nasal disease to the larynx. Within the larynx he discovered the impress in the form of a chronic irritative hyperæmia of the larynx, brought about by the combined action of catarrhal discharges, habitual mouth-breathing, and inflammatory extension. Attacks of acute laryngitis, sometimes followed by bronchitis, are often observed in individuals exhibiting chronic hyperæmia of the laryngeal lining membrane. He recognized the deviated septum as a most common cause of nasal catarrh, producing this disease by pressure and irritation, interference with nasal drainage, and unequal distribution of the nasal respiratory functions. He pointed out the importance of heredity, as a factor responsible for the

existence of certain forms of deviated septum, and noted the conditions indicating the hereditary character of these abnormalities.

Viewing the larynx as really the upper portion of the lung, although divided from it on artificial anatomical grounds, we are enabled to determine approximately by the appearance of the laryngeal and tracheal mucous membrane what conditions may exist beyond the line of laryngoscopic vision, and thus complete the pathological picture, beginning in the nares and ending in the lungs.

Appended to this paper were the clinical reports of a few illustrative cases, showing the benefits of treatment directed to the upper air-tract in chronic pulmonary disease.

DISCUSSION.

Dr. BOARDMAN REED said that from the stand-point of the general practitioner he could see no special connection between nasal catarrh and phthisis. Both were frequent, but he had seen them separate more frequently than combined. He did not see any necessary connection between them.

Dr. ROBINSON thought that the title of the paper was open to criticism. He did not think that clinical experience warranted the view that there is any direct connection between the two morbid states, such as cause and sequence.

Dr. GOODWILLIE had not been able to determine any direct connection between the depth of the vault of the palate and the nasal chambers. He believed it to be caused principally by the greater development of the alveolar ridges in some. This did not affect the nasal cavities, however, but if the intermaxillary bone were pushed back it would produce contraction of the nasal meatus.

Dr. JARVIS said that he had not attempted to prove the relationship of nasal affections to phthisis, as he thought that such a connection had been pretty well settled, as it has been accepted by Niemeyer, Billroth, and Koch, in Germany. He had merely shown how such results might follow. He had been particular in his statement that not all high palates were accompanied by nasal catarrh, but only those with the abrupt elevation of the middle ridge. The existence of an intermaxillary bone is doubted by some of the best embryologists.

Dr. ROBINSON, by permission, said that he did not wish to criticise the paper, but merely to state that the conditions pointed out were quite rare, while phthisis is common. With due respect, he did not feel willing to accept the authorities quoted, who are not accustomed to looking into the larynx or nasal passages.

The President announced as members of the Nominating Committee Drs. F. C. Shattuck, Boardman Reed, B. F. Westbrook, J. C. Wilson, and E. D. Hudson, jr.

A NEW INSTRUMENT.

At the evening session Dr. JARVIS exhibited a scoop constructed for the purpose of removing adenoid vegetations from the vault of the pharynx. It is made of steel, cylindrical and flattened at the extremity, which is directed upward so as to pass behind the soft palate. He had also found it useful in removing carcinomatous masses.

Dr. BOSWORTH thought that the instrument would be an improvement upon the gouge. He said that the more he saw of cases of nasal catarrh in children, the more he became convinced that the majority of them—say nineteen out of twenty—are due to hypertrophy of the glandular tissue, and not due to hypertrophy of nasal mucous membrane. Therefore he thought remedial measures should be directed to the pharyngeal vault rather than to the nasal passages.

FURTHER CONSIDERATION OF PNEUMATIC DIFFERENTIATION, WITH DEMONSTRATION OF THE PNEUMATIC CABINET.

Dr. H. F. WILLIAMS, of Brooklyn, exhibited an iron cabinet, with glass front, large enough to hold a patient in a sitting posture, which was so arranged as to permit partial exhaustion of the contained air and the admission of air under pressure for inhalation. The paper described the apparatus and the principles of treatment (already described in *Medical Record* for February 13). He believes that there is a position in our therapeutics for pneumatic differentiation in the treatment of pulmonary disorders, and this method presents some points worthy of further inquiry. The five cases referred to in the previous article on the subject are still doing well. He insisted upon the importance of early treatment of phthisis. Children

should be taught to breathe properly. Many persons pass their lives in seeking what they can never attain—perfect health. In many cases relief and improvement is all that can be expected. The results from the pneumatic treatment have been very satisfactory. It is possible that it might be abused by unskilful hands, and do injury, but he had never witnessed any bad results attributable to the use of the cabinet. One case used the treatment for some thirty times safely, but hemorrhage came on shortly after stopping the treatment. He had never seen a hemorrhage come on during the use of the cabinet. In connection with the cabinet, medical inhalations are practised under pressure, and the usual constitutional treatment employed. The method is applicable not only to phthisis pulmonalis, but also to emphysema.

Remarks were made by the PRESIDENT, Dr. ARMOUR, of Brooklyn, and others.

HOME-TREATMENT OF CONSUMPTION.

Dr. F. C. SHATTUCK, of Boston, read a paper advocating a more intelligent home-treatment of consumptives, in view of our advanced knowledge of the nature and course of the disease. He compared the statement made by a French professor twenty years ago, "The treatment for phthisis is opium and lies," with the recent teaching by Jaccoud that "pulmonary phthisis is curable in all its stages." Cases of consumption get well under the climatic treatment, and even under no treatment at all. By statistics taken from the Massachusetts State Board of Health Reports, he demonstrated the fact that there has been a gradual, though not regular, decline in the mortality from this disease from 1857, when it was 33.93, to 1883, when it was 29.90 per thousand of all classes of the population.

"Phthisis—or the bacillus tuberculosis, if you please—is one of those weeds which flourish best upon poor soil, but at the same time it exhausts what little virtue may be remaining in the soil."

The lecturer then considered in detail the regimen suited to a consumptive, and advocated the use of palatable, nutritious, easily-digested food, taken frequently; moral treatment; sensible dress, including woollen under-garments; fresh air, exer-

cise, sun-baths, congenial occupation, cleanliness of person, and respiratory gymnastics.

The medical treatment was then outlined. Cod-liver oil is to be avoided if the tongue is coated or digestion defective. He recommends a combination of morphine, atropine, and capsicum, for the relief of cough, diarrhœa, and night-sweats. Quinine is useful in large doses for the fever, either by the mouth or hypodermically (in the latter case the hypobromite is the best preparation). The salicylate of sodium is also valuable where the fever is caused by resorption.

The paper was favorably discussed by Drs. ARMOR, KRETZSCHMAR, and ROBINSON, the latter regretting that the author had omitted three methods of treatment: (1) forced feeding, "lavage and gavage;" (2) intra-pulmonary injections; (3) antiseptic inhalations.

On the second day the morning session was opened by the reading of a paper sent by CHARLES DENISON, M.D., of Colorado, entitled

A RULE FOR THE EVEN DIVISION OF CLIMATE, BASED UPON THE AVERAGE OF THE COMBINED ATMOSPHERIC HUMIDITIES IN THE UNITED STATES.

This was read, in the absence of the author, by J. H. Tyndale, M.D., of New York.

It was a continuation of a paper presented last year, and was accompanied by maps, showing graphically the relative dryness, mean temperature and elevation, direction of winds, and average amount of sunshine in different parts of the United States, made in conjunction with the Signal Service Bureau.

He believed that the most important quality of climate is dryness. The range of temperature is of greater moment than the mere statement of averages or means, which are very misleading.

The President, in opening the discussion, said that there was a great deal of interesting information contained in the maps, but they did not include everything to be considered in comparing health-resorts. He referred to the porosity of the soil as a very important feature. Dr. Bowditch in 1862 had shown the relation existing between humidity of the soil and

pulmonary disorders. It is not the amount of rainfall or the humidity of the atmosphere, so much as the natural drainage of the soil, which is to be considered. Apparently everything theoretically would be against the Adirondack region as a health-resort for consumptives; but the porosity of the soil, there being no clay in it, makes it what it is.

Dr. A. N. BELL thought that reliable statistics contradicted the views that dryness is the most important point in the atmosphere to the consumptive, and that the great danger is moisture. The number of deaths per thousand of population from phthisis pulmonalis is about the same in Colorado as in Florida, which is very damp. Forests are great storehouses of moisture, and yet they are salutary. At sea the atmosphere is saturated, and yet from English reports it has been shown that the number of deaths among seamen from consumption is ten times less than among similar numbers on shore, and if compared with men of the same age, the death-rate is only one-sixteenth that of landsmen. Moisture is therefore not the most dangerous element in the atmosphere. The writer should also have referred to ozone and atmospheric electricity as important factors in a good climate. In conclusion, he opposed the idea that excessive dryness and altitude are the essential qualities of a good climate for consumptives.

BOSTON MEDICAL LIBRARY ASSOCIATION

Dr. BOARDMAN REED was glad to hear the protest of the preceding speaker against regarding altitude and dryness as essential in the treatment of consumption. He thought that the patients are benefited by agreeable society as well as by pure air. The sea-shore has a long-established reputation as a health-resort, and his own observation was that in Atlantic City many pulmonary patients do well. He referred also to the ozone developed by the spray beating on the shore.

Dr. TYNDALE, in conclusion, repeated the statement that altitude, dryness, and equability of temperature were the main points worthy of consideration in the ideal climate for consumptives.

GEOGRAPHICAL DISTRIBUTION OF PHTHISIS IN MICHIGAN, WITH SKETCH OF TOPOGRAPHY.

This paper was contributed by E. L. SHURLEY, M.D., of Detroit, Mich., and was read by the Secretary.

Regarding the telluric and geographical aspects of health-resorts for phthisis as of great importance, Dr. Shurley undertook a systematic investigation of the climatic qualities of Michigan. Without attempting an analysis of this valuable contribution, it may simply be noted as a significant fact that in those counties where the soil was loose and sandy and permitted free drainage, he could not discover that a single case of pulmonary phthisis had originated.

"The Treatment of Laryngeal Tuberculosis" was read by title in the absence of its author, Dr. E. F. Ingalls, of Chicago.

"The Problem of Acclimatization" was the subject of a paper contributed by I. H. Platt, M.D., of Brooklyn.

At the afternoon session J. C. WILSON, M.D., of Philadelphia, read a paper entitled

REMARKS UPON THE CLIMATE OF FLORIDA.

Dividing the peninsula into four parallel strips or regions, we have, (1) the Atlantic seaboard, (2) the St. John's River, (3) the elevated pine-lands forming the water-shed of the State, and (4) the Gulf coast. The great characteristics of all these regions are mildness and equability. Within a year the railroad has opened up the Gulf coast, which possesses special peculiarities. Here is the perfection of warm maritime climate, from Cedar Keys to Punta Rassa. The atmosphere is pure, free from dust, and rich in ozone; the temperature mild and equable; the movement of the air moderate, but continuous. The air is remarkably dry, the rainfall is small. The small peninsula terminating in Point Pinellas on Tampa Bay offers especial attractions as a sanitarium. There are no frosts and no malaria, and the water of the bay is sufficiently warm to permit bathing all the year round.

JOHN M. KEATING, M.D., of Philadelphia, also read a paper upon the same subject, but paying especial attention to the lake region as a winter health-resort. A caution was expressed against sending patients to Florida without definite ideas of their destination. Both St. Augustine and Jacksonville are undesirable, as a rule, for consumptives. The accessibility of Florida gives it especial value for sanitaria.

THE RESULTS OF THE HOME-TREATMENT OF CONSUMPTION CONTRASTED WITH THOSE OF CHANGED RESIDENCE AND CLIMATE

was the subject of a paper read by Dr. E. D. HUDSON, JR., of New York.

The pathology of phthisis was discussed according to recent views, and a favorable view taken of the possibilities of home-treatment with the aid of modern appliances.

HAY FEVER AND ALLIED AFFECTIONS.

F. H. BOSWORTH, M.D., of New York, called attention to the etiology of hay fever, and the relation of nasal hypertrophies to spasmodic attacks of cough. He denied that there was any structure in the nasal passages to which the name erectile tissue could properly be applied. He advised operation by cautery, and the correction of abnormalities in the nasal chambers in cases of hay fever and allied affections.

THE HISTORY OF THE STETHOSCOPE.

Dr. D. M. CAMMANN read a paper with this title, and presented a modification of the Cammann stethoscope.

Laennec, if he did not originate the idea of the stethoscope, made it practically useful. His first instrument was a cylinder of wood perforated by a bore three lines wide. This was modified by Piorry, who constructed a more slender instrument. Trumpet-shaped ends were first devised by Dr. Williams about 1843. Descriptions of many non-aural stethoscopes made of various materials, are found scattered through the files of medical journals. About 1850, Landouzy, of Paris, constructed a binaural instrument with flexible tubes. Previous to this Dr. Williams had used a double stethoscope, but it was inflexible and awkward of application. The stethoscope of Dr. Leared, shown at the International Exhibition of 1851, was an improvement on these.

In the same year Dr. Marsh, of Cincinnati, patented a double stethoscope. Dr. Cammann was familiar with the principle of these instruments. His binaural stethoscope, therefore, was not a new invention, but was and is now the best instrument of the kind devised. It was perfected in 1852, and

described in the *New York Medical Times* of January, 1855. Reference was made to the differential stethoscope of Scott Alison, the hydrophone, and the stethoscope of Constantine Paul.

OFFICERS AND COMMITTEES FOR THE ENSUING YEAR.

President, Dr. William Pepper, of Philadelphia; *Vice-President*, Dr. Frank Donaldson, of Baltimore; *Second Vice-President*, Dr. Beverly Robinson, of New York; *Secretary and Treasurer*, Dr. J. B. Walker, of Philadelphia; *Council*, Drs. Wilson and Hudson, of Philadelphia, Tyndale and Bosworth, of New York.

Committee on Sanitaria: Dr. N. C. Van Bibber, of Baltimore; Dr. E. L. Medean, of Saranac Lake, N. Y.; Dr. Boardman Reed, of Atlantic City; Dr. Charles Denison, of Denver, Col.; Dr. H. A. Johnson, of Chicago. *Committee on Mineral Springs:* Dr. Cable, of Charlotteville, Fla.; Dr. William Osler, of Philadelphia; Dr. Gebhart, of Hot Springs; Dr. Burchard, of New York; Dr. D. E. Borger, of Paro Robles Springs, Col. *Committee on Health Resorts and Collective Investigations:* Dr. F. C. Shattuck, of Boston; Dr. A. N. Bell, of Brooklyn; Dr. A. Y. P. Garnett, of Washington; Dr. H. V. Miller, of Atlanta, Ga.; Dr. E. L. Shurley, of Detroit, Mich.

BED-CLOTHES MADE OF PAPER.—The *Paper-Maker* says that a paper-making firm in New Jersey has for several weeks been turning out counterpanes and pillows of paper. No. 1 manilla paper is used, two large sheets being held together by a slender twine at intervals of three or four inches. The slender twine is gummed so as to hold the sheets firmly together where it lies. A hem is placed on the counterpane to keep it from tearing; the safety edge is composed of twine. Ornamental designs are stamped in the outer surfaces of the covers and cases, giving them a neat, attractive appearance. When these counterpanes and pillow-cases become wrinkled from use, they can easily be smoothed out with a hot flat-iron. The counterpanes can be left on the bed when it is occupied, and in cold weather will be found a warm covering, paper preventing the escape of heat. The new paper bed-clothing is seventy-five cents per set, and will probably become very popular.

THE PROGRESS OF STATE MEDICINE IN MINNESOTA—COMPREHENDING THE MOST RECENT LAWS.

SECTION 1. Whenever any part of this State appears to be threatened with, or is affected by, any epidemic or infectious disease, the State Board of Health may make, and from time to time alter and revoke, regulations for all or any of the following, among other purposes:

1. For the speedy interment of the dead.

2. For house to house visitation.

3. For the provision of medical aid and accommodation for patients, physicians, and nurses.

4. For the promotion of cleansing, ventilation, and disinfection; and

5. Guarding against the spread of disease by quarantine or exclusion of any infected persons, and may by order declare all or any of the regulations so made to be in force within the whole, or any part or parts of the district of any local Board of Health in this State, and to apply to any vessels on any of the waters of this State, or to any railway cars or trains, or public vehicles of any kind, for the period named in such order, and may by any subsequent order abridge or extend such period.

SEC. 2. All regulations and orders so made by the State Board of Health shall be published in some paper of general circulation published at the capital of the State, and also in some paper published in the county where such disease may exist, and such publication shall be conclusive evidence thereof for all purposes.

SEC. 3. The local Board of Health of any district or districts within which, or part of which, regulations so issued by the State Board of Health are declared to be in force, shall superintend and see to the execution thereof, and shall appoint and pay such medical or other officers or persons, and do and provide such acts, matters, and things as may be necessary for mitigating or preventing the spread of any such disease, or for

superintending or aiding in the execution of or executing such regulations as the case may require; said local board may also from time to time direct any prosecution or legal proceedings for or in respect of the wilful disregard or neglect of any such regulation, or any regulation duly made and established by said local board. Said local boards shall have power of entry on any premises, vessel, or vehicle, for the purpose of executing, or superintending the execution of, any regulations so issued by said State Board of Health, or said local board.

SEC. 4. All towns, villages, boroughs, and cities shall have a Board of Health, who shall have and exercise all the powers necessary for the preservation of the public health. Said board shall consist of not less than three (3) members, one (1) of whom, when practicable, shall be a physician, and such physician shall be health officer and executive officer of the board, and shall receive such compensation for his services as the council or other body answering thereto, of the town, village, borough, or city, shall determine. Said board shall be elected annually by the council, or other body answering thereto, of each town, village, borough, and city, unless a different term or mode is now provided by law, and such election shall be had at the next election that shall be held by such body. It shall be the duty of the health officer to perform and superintend the work prescribed in this act, and shall perform such other duties as the board may require. He shall furnish to the board such information cognate to this act as from time to time they may deem necessary, and to make once in each year, in the month of May, and oftener if necessary, a thorough sanitary inspection of said town, village, borough, or city, and present a written report of such inspection at the next meeting of the Board of Health, and he shall forward a copy of said report, as soon as rendered, to the State Board of Health; and he may at any time, when necessary, examine into all nuisances, sources of filth, and causes of sickness, and said board may make such regulations respecting the same as they may judge necessary for the public health and safety of the inhabitants; and every person who shall violate any order or regulation made by any Board of Health, and duly published, shall be deemed guilty of misdemeanor, and punished by a fine not exceeding one hundred dollars ($100),

or by imprisonment in the county jail not exceeding three (3) months.

SEC. 5. Notice shall be given by the Board of Health of all orders and regulations made by them, by publishing the same in some newspaper, if there is one published in such town; if there is none, then by posting up such notice in five (5) public places therein; and such publication of said orders and regulations shall be deemed a legal notice to all persons.

SEC. 6. Whenever a nuisance, source of filth, or cause of sickness is found on private property, the Board of Health shall order the owner or occupant thereof, at his own expense, to remove the same within twenty-four (24) hours; and if the owner or occupant neglects so to do, he shall forfeit a sum not exceeding fifty dollars ($50), to be recovered in the name of and for the use of the town, city, or village.

SEC. 7. Whenever such owner or occupant shall not comply with such order of the Board of Health, said board may cause the said nuisance, source of filth, or cause of sickness to be removed, and all expenses incurred thereby shall be paid by the said owner or occupant, or by such other person as has caused or permitted the same.

SEC. 8. Whenever the Board of Health thinks it necessary, for the preservation of the health of the inhabitants, to enter any building or vessel in their town for the purpose of examining into and destroying, removing, or preventing any nuisance, source of filth, or cause of sickness, and shall be refused such entry, the health officer, or any member of the board, may make complaint under oath to a justice of the peace of his own town, stating the facts in the case so far as he has knowledge thereof.

SEC. 9. Such justice shall thereupon issue a warrant, directed to the sheriff or any constable of the county, commanding him to take sufficient aid, and being accompanied by (2) or more of the Board of Health, between the hours of sunrise and sunset, to repair to the place where such nuisance, source of filth, or cause of sickness complained of may be, and the same destroy, remove, or prevent, under the direction of the members of such Board of Health.

SEC. 10. All local Boards of Health and health officers shall make such investigations and reports, and obey such direc-

tions as to infectious diseases, as shall be directed by the State Board of Health. And any member of any Board of health, or health officer, who shall neglect to perform the duties required of him under the provisions of this act, or any other act relating to the duties of the boards of health or health officers of this State, or who shall neglect or refuse to obey any reasonable directions as to infectious diseases as shall be directed by the State Board of Health, shall be liable, upon conviction in any court having competent jurisdiction, to be fined in a sum not less than twenty-five ($25) dollars, or more than one hundred ($100) dollars, and shall become disqualified from holding the office of a member of the board of health.

SEC. 11. When any local board of health are of the opinion that the cleansing and disinfection of any house, building, car, vessel, or vehicle, or any part thereof, and of any articles therein likely to retain infection, would tend to prevent or check infectious disease, it shall be the duty of such authority to give notice in writing to the owner or occupier of such house, vessel, or vehicle, or part thereof, requiring him to cleanse and disinfect such house, vessel, or vehicle, and the said articles, within a time specified in said notice. If the person to whom notice is so given fails to comply therewith, he shall be liable to a fine of not less than twenty-five ($25) dollars, nor more than one hundred ($100) dollars for every day during which he continues to make default, and said board shall cause such house, vessel, or vehicle, and articles to be cleansed and disinfected, and may recover the expenses incurred, and said fine and costs of prosecution, in a civil action before any justice of the peace or court having jurisdiction in like cases, which sum when recovered shall be placed to the credit of a special fund for the purpose of said local board of health [to be used] by said board for general expenses. *Provided*, that where the owner or occupier of any such house, vessel, or vehicle is, from poverty or otherwise, unable in the opinion of said local board effectually to carry out the requirements of said board in said notice, such authority may, without enforcing such requirements on such owner or occupier, with his consent, cleanse and disinfect such premises and articles and defray the expenses thereof.

SEC. 12. Any local board may direct the destruction of any bed or bedding, clothing, carpets, or other articles which have been exposed to infection from contact with infected persons or articles, and may allow compensation for the same, or may provide a proper place, with all necessary apparatus and attendance for the disinfection of such articles, and may cause any articles brought for disinfection to be disinfected thereby, and said board may provide and maintain when necessary, a carriage or carriages suitable for the conveyance of such articles or of persons suffering under any infectious disorder, and may pay the expense of conveying therein any person so suffering to a hospital or other place of destination.

SEC. 13. Where any suitable hospital or place for the reception of the sick is provided within the district of any local board, or within a convenient distance of such district, any person who is suffering from any dangerous infectious disorder, and is without proper lodging or accommodation, or lodged in a room occupied by more than one (1) family, or is on board any vessel, cars, or other vehicle, may, on a certificate signed by a qualified medical practitioner or the executive officer of said board, and with the consent of the superintending body of such hospital or place, be removed by order of any justice to such hospital or place at the cost of the local district; and any person so suffering, who is lodged in any common lodging or boarding-house, may, with the like consent and on a like certificate, be so removed by order of the local board. An order under this section may be addressed to such constable or officer as the justice or local authority making the same may think expedient, and any person who wilfully disobeys or obstructs the execution of said order shall be liable to a fine not exceeding fifty dollars ($50), to be recovered on criminal complaint, and the sum so recovered shall be paid over to said board for general expenses thereof.

SEC. 14. The State Board of Health may, by order, require any two (2) or more local boards to act together for the purposes of the provisions of this act, for the prevention of epidemic diseases.

SEC. 15. When any person coming from abroad, or residing in any town, village, borough, or city within this State, is infected, or lately has been infected, with the small-pox or other

contagious disease dangerous to the public health, the board of health of the town, village, borough, or city where such sick or infected person is, may immediately cause such person to be removed to a separate house, if it can be done without danger to his health, and shall provide for such person or persons nurses, medical attendance, and other necessaries, which shall be a charge in favor of such town, village, borough, or city upon the person so provided for, his parents, guardian, or master, if able; or otherwise upon the county in which he has a legal settlement, or upon the State, if said person be a non-resident of the State, and has no property within the State; in which latter case the bills for such expenses shall be paid only after being audited and approved by the State Board of Health and by the Governor, and said bill shall be allowed only on condition that the local board of health shall have promptly, on the appearance of such disease, notified the State Board of Health thereof, and shall have followed the instructions and regulations of said State Board given with respect to the care and expense in the case or cases in reference to which said bills were incurred, and further shall file satisfactory evidence to said State Board that such person or persons were non-residents of the State and have no property within the same. The town, village, borough, or city, as the case may be, may recover in a civil action against the person or persons or the county chargeable under this section.

SEC. 16. If such infected person cannot be removed without danger to his health, the board of health shall make provision as directed in the preceding section for such person in the house where he may be, and in such case they may cause the persons in the neighborhood to be removed, and [may take such other measures as they] may deem necessary for the safety of the inhabitants.

SEC. 17. When a disease dangerous to the public health breaks out, the board shall immediately provide such hospital or place of reception for the sick and infected as is judged best for their accommodation, and the safety of the inhabitants, which shall be subject to the regulations of the board; and the board may cause any sick and infected persons to be removed thereto, unless his condition will not admit of such removal without danger to his health, in which case the house

or place where he remains shall be considered as a hospital, and with all its inmates, subject to the regulations of the board.

SEC. 18. [It] shall be the duty of all local boards of health, whenever they are informed that there is a case of small-pox, scarlet fever, diphtheria, or other infectious or contagious disease within the territory over which it has jurisdiction, to immediately examine into the facts of the case, and if the disease appears to be of the character above specified, they shall adopt such quarantine and sanitary measures as may in their judgment tend to prevent the spread of said disease in its locality, subject to be modified by the State Board of Health, and shall immediately notify the secretary of said State board of the appearance of such disease and the measures adopted by said local board in relation thereto.

SEC. 19. And said boards of health shall have power to forbid, by notices posted upon the entrances to premises where there may be a patient sick with such disease, any person except the medical attendants and spiritual advisers, from going to or leaving said premises without their permission, or carrying or causing to be carried, any material whereby said disease may be conveyed, until after said disease has abated and the premises, dwelling, and clothing have been rendered free from disease by such disinfecting means as the board may direct; and if said board shall be informed that the above, or any reasonable or sanitary measures which they have adopted and made public, is or has been violated, then the said board may cause said offender against this act to be apprehended and brought before an officer having jurisdiction; and said offender shall, upon conviction, be liable to a fine in the sum of not less than five dollars ($5) nor more than twenty-five dollars ($25) for any violation under this act. Any member of any board of health who shall neglect his duties under the provisions of this act shall be liable, upon conviction in a court having competent jurisdiction, to be fined in a sum not less than twenty-five dollars ($25) nor more than one hundred dollars ($100) for the first offence; and for conviction for violation of this act the second time, shall, in addition to the fines already provided, become disqualified from holding the office of, or to which is attached the duties of a member of a board of health.

SEC. 20. All fines collected under this act shall be placed to the credit of a special fund of the city, village, or town in which the offence is committed, for the use and expenses of said board. That every physician shall report to the local board of health, in writing, every person having a contagious disease, and the state of his or her disease, and his or her place of dwelling, and name if known, which such physician has prescribed for or attended for the first time since having a contagious disease, or since the discovery of the same to be contagious, during any part of the preceding twenty-four (24) hours; but not more than two (2) reports shall be required in one (1) week concerning the same person; but every attending physician thereat must see that such report is or has been made by some attending physician.

SEC. 21. That it shall be the duty of each and every practising physician in this State, to report in writing to the local board of health the death of any of his patients who shall have died of contagious or infectious disease, within twenty-four (24) hours thereafter, and to state in such report the specified [specific] name and type of such disease.

SEC. 22. That every keeper of any private house, boarding-house, or lodging-house, and every innkeeper and hotel-keeper shall, within twenty-four (24) hours, report in writing to the local board of health the same particulars required of any physician in the preceding section, concerning any person being at any of the aforesaid houses and hotels, and attacked with any contagious disease dangerous to the public health.

SEC. 23. That it shall be the duty of every person knowing of any person sick of any contagious disease dangerous to the public health, and the duty of every physician hearing of any such sick person, who he shall have reason to think requires the attention of the local board, to at once report the facts to the board in regard to the disease, condition, and dwelling-place, or position of such sick person.

SEC. 24. That no person shall, within the limits of any town, city, or village within this State, without a permit from the local or State Board ofHealth, carry or remove from one (1) building to another, or from a vessel to the shore, or any railway cars, any person sick of any contagious disease, or the body of any person having died of contagious disease; nor

shall any person, by any exposure of any individual sick of any contagious disease or of the body of such person, or by any negligent act connected therewith, or in respect to the care and custody thereof, or by a needless exposure of himself, cause, or contribute to, or promote the spread of disease from any such person or from any dead body.

SEC. 25. That every person being the parent or guardian, or having the care, custody, or control of any minor or other person, shall, to the extent of any means, power, or authority of said parent, guardian, or other person, that could properly be used or exerted for such purpose, cause and procure such minor or person under control to be so promptly, frequently, and effectively vaccinated that such minor or individual should not take, or be liable to take, the small-pox.

SEC. 26. That no principal, superintendent, or teacher of any school, and no parent, master, or guardian of any child or minor, having the power and authority to prevent, shall permit any child or minor having scarlet fever, diphtheria, small-pox, or any dangerous, infectious, or contagious disease, or any child residing in any house in which any such disease exists, or has recently existed, to attend any public or private school until the Board of Health of the town, village, borough, or city shall have given its permission therefor; nor in any manner to be unnecessarily exposed, or to needlessly expose any other person to the taking or to the infection of any contagious disease.

SEC. 27. That no person shall allow to be retained unburied the dead body of any human being for a longer time than four (4) days, or where death has been caused by a contagious disease for a longer time than twenty-four (24) hours after the death of such person, without a permit from the local Board of Health, which permit shall specify the length of time during which such body may be retained unburied; and when death has been caused by a contagious disease the body shall, if directed by said board, be immediately disinfected in such manner as may be directed by said board and enclosed in a tightly sealed coffin, which shall not thereafter be opened, and the funeral of such person shall be strictly private, and in the removal thereof for burial or otherwise hearses or such other vehicles as may be authorized by said board only shall be employed.

SEC. 28. Said Boards of Health may employ all such persons as shall be necessary to carry into effect the provisions of this act and the regulations duly established by said boards as herein provided, and may fix their compensation. The said boards shall have power to employ physicians and provide necessaries for persons in cases of poverty, and generally to pay such expenses as are necessarily incurred by them in taking precautions which they may deem necessary to the public health.

SEC. 29. All expenses so incurred by any town or village Board of Health, heretofore or hereafter, shall, in the first instance, be borne and paid out of the town or village treasury, as the case may be, by orders on the treasurer thereof issued by said board, and payable out of the special fund herein mentioned, if sufficient; if not, out of the general fund. The proper authorities of villages and towns shall certify the amount required to reimburse said general funds, to the county auditor at the time of certifying other taxes, and such auditor shall extend on the tax-list of the county a tax sufficient to pay the amount so certified, which tax shall be collected as other taxes and paid over to said town or village treasurer, as the case may be.

SEC. 30. Any person who shall wilfully violate any of the provisions of this act, or of any regulations duly made and published by any of the Boards of Health herein mentioned—the penalty for which is not herein specifically provided for—shall be guilty of a misdemeanor; and upon conviction thereof shall be subject to a fine not to exceed one hundred dollars ($100), or imprisonment not to exceed thirty (30) days, or both such fine and imprisonment. All amounts so collected shall be paid to the town, village, or city treasurer and placed to the credit of a special fund for the purposes and expenses of the said local Board of Health.

SEC. 31. This act shall take effect and be in force from and after its passage; and all acts and parts of acts inconsistent with this act are hereby repealed.

STATE MEDICINE IN KANSAS.

THE following is a copy of the act passed at the last session of the Kansas Legislature creating a State Board of Health:

HOUSE BILL 167: To create State and Local Boards of Health, and to regulate the practice of medicine in the State of Kansas.

Be it enacted by the Legislature of the State of Kansas: SECTION 1. Within thirty days after this act shall take effect, the Governor, by and with the advice and consent of the Senate, if it be then in session, shall appoint from different parts of the State nine (9) physicians, who shall be men of good moral character and temperate habits, of not less than seven years' continuous practice in their profession, and each of whom shall be a graduate of a respectable medical college; and said nine physicians, when so appointed and confirmed, shall be known as the Kansas State Board of Health. Three of said physicians shall be appointed for one (1) year, three for two (2) years, and three for three (3) years; and annually thereafter the Governor shall in like manner appoint three physicians of like character and qualifications to fill the vacancies occurring in said Board by reason of the expiration of the terms of service, as herein provided; and the persons so appointed shall hold their respective offices for the like term of three years, and until their successors are appointed and qualified; but in no case shall the Governor appoint a majority of the physicians that shall constitute said Board of Health from any one school of medical practice, nor shall said board at any time be composed of persons a majority of whom shall be of the same school of medical practice. Upon the appointment of the nine physicians provided for in this act, the Secretary of State shall issue to each of them a certificate of his appointment; and within twenty days after such appointment the said nine persons shall meet in the City of Topeka, and they shall each take and subscribe the oath prescribed by law for State officers; which oath shall be filed with the Secretary of State; and thereupon said Board

shall immediately organize by electing one of its number president. They shall also elect a secretary, and said secretary shall be the executive officer of said Board, but not a member thereof. The secretary shall execute a bond in the sum of $5,000, which shall be filed with the Secretary of State.

SEC. 2. The State Board of Health shall adopt and publish such rules as may be necessary to make this act effective and facilitate the transaction of its business. It shall provide a seal, and all correspondence and papers emanating from it shall be under the seal of said Board. It shall meet quarterly, or oftener if deemed necessary, the first meeting to be held at Topeka. The annual meeting after the first shall be held at Topeka in June of each year. No member of the Board shall receive any compensation for services rendered, except for travelling and other necessary expenses while employed on the business of the Board. The secretary shall receive such compensation as may be allowed by the State Board of Health and approved by the Governor.

SEC. 3. The secretary shall hold his office so long as he shall faithfully discharge the duties thereof; but may be removed for just cause at any regular meeting of the Board. He shall keep a record of all the transactions of the Board, shall communicate with other State Boards of Health, and with the local Boards of Health within this State.

SEC. 4. The State Board of Health shall supervise the health interests of the people of this State. They shall make careful inquiry into the cause of diseases, epidemics, investigate the sources of mortality, and the effects of localities, employments, conditions, habits, and surroundings on the health of the people. They shall advise officers of government, or other State Boards, in regard to the location, drainage, water-supply, disposal of excreta, heating and ventilation of public buildings. They shall collect and preserve such information relating to forms of disease and death as may be useful to them.

SEC. 5. The State Board of Health shall supervise the registration of marriages, births, and deaths, and also the registration of forms of disease prevalent in the State, and the secretary shall superintend the registration of the vital statistics of the State. The State Board of Health shall also prepare the forms and establish the rules by which permits for transporting

the dead bodies of persons for burial beyond the county where the death occurs, and in all cases the said Board of Health shall require coupons to be attached to such permits, to be detached and preserved by every common carrier, or the person in charge of any vessel, railroad train, or vehicle to which dead bodies shall be delivered for transportation. Any violations of these rules shall subject the offender to a fine of $10 for each offence.

SEC. 6. The State Board of Health shall appoint committees or engage suitable persons to render special sanitary service, to make practical or scientific investigations and examinations. And it is hereby made the duty of all officers and agents having the control of any public work to permit any examination ordered by said Board, and the members of said Board, and such other officer or person as may at any time be by said Board authorized, may examine and survey all grounds, erections, vehicles, structures, etc.

SEC. 7. The County Commissioners of the several counties of this State shall act as local boards of health for their respective counties. Each local board thus created shall elect a health officer, who shall be a member of the board.

SEC. 8. Every person proposing to engage, or to continue in the practice of medicine in this State, shall, within thirty days after the organization of the State Board of Health, present to the secretary of said Board a diploma from a legally organized medical college, or an affidavit or other satisfactory evidence that the applicant is a graduate in medicine from such school, which shall be submitted to the State Board of Health at its next meeting; and, if satisfactory to said Board, a certificate shall be given, which certificate shall be recorded by the County Clerk and kept in the office of the County Clerk, and this certificate shall be conclusive evidence of the right of the owner of the same to practise medicine in the place designated in the certificate; and any person who is not a graduate of a reputable school of medicine shall present himself before the State Board of Health at any regular meeting of the Board, and submit to such elementary and practical examination by the Board of health as shall test the qualifications of the candidate as a practitioner of medicine, surgery, and obstetrics; and every candidate passing a satisfactory examination shall receive a

certificate. This act shall not apply to commissioned officers of the United States Army or Navy or Marine Hospital Service.

SEC. 9. Every person applying for a certificate, as provided for in this act, as a graduate, shall pay a fee of $1 ; and every person applying for a certificate, on examination, shall pay a fee of $10, all of which shall be paid into the State treasury. And every person practising, or attempting to practise, medicine in this State without such certificate regularly filed with the clerk of the county in which he resides, shall, upon conviction, be fined not less than $10 nor more than $100 for each and every offence, to which may be added imprisonment not to exceed ninety days. And a person filing, or attempting to file, as his own a bogus diploma or a false affidavit of identification, shall be guilty of a felony, and, upon conviction, shall be subject to such fine or imprisonment as provided by the statutes of this State for the crime of forgery, and shall forfeit all right to practise medicine in this State. And any itinerant physician who shall, by writing or printing, or by any other method, publicly profess to cure or treat diseases, injuries, or deformities, shall pay to the State Treasurer a special tax of $100 each month he shall practise ; and for every failure to pay such tax prior to engaging in such practice he shall, upon conviction, be fined not less than $100 for each offence, or imprisonment for not less than ninety days in the county jail, or both.

SEC. 10. It shall be the duty of every physician practising his profession in the State of Kansas to keep a record of the deaths occurring in his practice, noting the form of the disease, and to report the same to the local board of health ; and any failure to do so will subject said physician to a fine of $10 for each offence.

SEC. 11. It shall be the duty of assessors of personal property in the several townships and wards of cities throughout the State annually to collect such information as to marriages, births, and deaths as may be required by the State Board of Health, and report the same to the local boards of health.

SEC. 12. It shall be the duty of the State Board of Health, on or before the first Monday in January of each year, to make a report in writing to the Governor of the State upon the vital statistics and the sanitary condition and prospects of the State,

and shall suggest any further legislation deemed proper for the better protection of life and health. The annual report of said Board shall contain a detailed account of the money paid out by or on account of said Board and a detailed statement of the manner of its expenditures during the past year, but the amount shall not exceed $5,000 in any year.

SEC. 13. All prosecutions under this act shall be conducted by the County Attorney for the county in which the offence was committed, in the court having jurisdiction; and all fines imposed and collected shall be paid into the county treasury to the credit of the school fund.

MEDICAL LEGISLATION.*

By HENRY O. MARCY, A.M., M.D., President of the Association.

IN our modern civilization the public press holds and wields a power in the development of thought and shaping of opinions equalled by no other of all the complex forces of government. This power is so omnipresent and far-reaching, that the village or hamlet is indeed very remote that does not receive and discuss the dominating thoughts of the world's great centres of civilization within the day upon which they are first published. We do not wonder that journalism makes a large bid for the best talent, or that it has been the highest ambition of many of our most learned men to spend their lives in addressing unseen audiences, moulding the well-springs of human thought through this magic of the black art. The fundamental principles for the right government of the public press, in a free country, must ever be simple, and may be abstractly stated as the attainment of the highest good of the individual. Thus, upon all general questions there must ever be a commonality of interest; and press-associations are eminently proper and profitable.

In a great and rapidly growing country, like America, the medical press is, in a specialistic way, of equal influence in the diffusion of knowledge, the elevation of the standard of attainment, and, in a generous rivalling, developing a spirit of noble

* The annual address before the Association of American Medical Editors, April 27, 1885. Reprinted from the Journal of the American Medical Association.

brotherhood in the profession. In this spirit this Association was founded. Let its members see to it that, as the American Medical Association has grown in influence and power, so may these annual meetings of medical editors prove a source of inspiration, of energizing force and influence.

Every physician contemplates with satisfaction the progress made in his profession within the last generation, the rapid strides toward a true scientific foundation upon which to build more broadly the superstructure of the healing art. The lawyer does not deem it necessary to confine himself alone to his specialistic study and practice; the rather does he find it to his professional advantage to enter the public arena, and become, if possible, the leader in every public work which holds an interest to the community in which he resides. From another platform, he who administers to us in sacred things is not alone the guide to holy living, but is expected to take into review all the general questions affecting the welfare of the race, and pass thereon a more or less critical opinion. The physician, however, who broadens out his phylacteries beyond the physical well-being of the community does so at the peril of his professional reputation and pecuniary sacrifice.

For this the profession holds no cause for complaint. The rather do its members the more willingly sacrifice at the shrine of their devotion all other ambitions as unholy, unworthy to be weighed in the balance, but minister to wrecked bodies and broken spirits for their mutual rebuilding, more or less closely copying the model of the Great Master. However varied the problems and kaleidoscopic the changes, there is always centred therein the fixed factor, the unknown quantity of the equation—life itself. In the true teaching the disciple of such a calling must have a thorough and generous general education, and the medical colleges are now yearly demanding, in preparatory training, a higher standard of medical attainment. What shall be the standard of medical knowledge before graduation to practise the art and assume the responsibilities of life itself, in comparison with which every other consideration pales into insignificance? This question has very properly been relegated to the profession, since it can be wisely determined by no other tribunal; but can any subject be of an interest more vital to the well-being of the individual or to the community? The relation

of the physician to the public is a theme never lacking in interest, and very properly, since under his ministrations we are ushered into existence, our follies and their penalties entrusted to his knowledge and care, the serious infractions of our physical laws readjusted by his skill, and our latest agonies watched over, as the mysteries of our being again become shrouded in the impenetrable veil of the future. This leads me to certain phases of the converse of the proposition: "The Relation of the Public to the Physician," and this, from the legal standpoint, is the theme to which I would to-night invite your most serious consideration. In the first place, the demand for the education of the physician has been publicly recognized by the establishment and, in part, maintenance of medical schools and colleges; this in common with the general requirements of the other learned professions. Of course, this has been in large measure moulded and the material equipment furnished by the profession itself much more largely than in any other class of special training. America must be judged, however, from a different standpoint than Europe, since here, beyond the general system of fundamental teaching, the State has left the supervision of the higher education almost entirely to private parties, under corporation-privileges and restriction, rather than by fostering their support. Gifts, other than from medical men, in large amount, for the better education of physicians, are, in America, very exceptional. The Johns Hopkins University, owing to the extraordinary liberality of its founder, gives promise of splendid advantages in its medical and biological teaching. The recent munificent gift to the College of Physicians and Surgeons of New York of America's railroad prince, William H. Vanderbilt, is a splendid recognition of the value for the public good which a liberal-minded citizen places upon the right training of medical students. Although we sadly lack in America the great central universities for the higher training which so justly distinguishes the older European civilizations, it cannot be said that our country is wanting in number, at least, of medical schools and colleges. For many reasons not pertinent to our present inquiry, we can but think that the supply, such as it is, has greatly exceeded the demand. From the above and other reasons, which, with equal pertinency, might be offered, it is not difficult to accept as fact that there is, by the

public, a general recognition and demand that those who make it their profession to attend upon the sick should have special training therefor. The recognition of this special fitness has been openly expressed by the granting of so-called "degress" by the schools, which are in turn under the guidance and control of the various State governments. So that a degree is, by so far at least, an official State recognition of the holder as commissioned to practise his calling. The title of "Dr." once given clings to its possessor with the pertinacity of fate. No matter how early he relinquishes his profession, or what his subsequent career, like the little brown jug of poetic history, this convenient handle is never disassociated from his name. If it is really true that the public hold the title of "Dr." in such affectionate and high regard, it would seem that they should grant it to none unworthy, and, like the judges of the Supreme Courts, allow its possessor to hold office only during good behavior. That they have just reason to regard the value of medical service there can be no question. The medical profession, in all ages and countries, has been recognized as public-spirited, devoted to the general good—the prevention as well as cure of disease. The greatest gain in modern medical science has undoubtedly been in the self-sacrificing, dangerous study of the causes of disease, and preventive medicine has developed into a branch now universally called sanitary science. Can any one over-estimate the incalculable advantage to the State of Massachusetts which has resulted from the untiring industry, devotion, and genius of a Bowditch, a Derby, a Folsom, a Wolcott, and many others, in developing a State medicine which has given to our old commonwealth fame, and made her methods models, in Europe as well as in America!

The limitation of legislative enactments for the protection of the individual has been and ought ever to be a question of the greatest interest. This has been guarded with a zealous care in our republic from the beginning, where the individual rights of the citizen have justly been considered the great corner-stone of liberty. However, there are certain limitations of individual privilege, essential to the public good, which are generally conceded. Thus the law guarantees, under certain penalties, reasonable individual safety in the passage upon the public highways, often looked upon by property-holders as

onerous; safety in the proper construction of buildings; the enactment of sanitary laws; the protection of the people from the sale of adulterated milk; unwholesome and improper food; restrictions upon the sale of drugs, poisons, etc.; and the rights of women, of minors, and of the insane, are carefully guarded.

Ought the people to exact guarantees in their own protection from their public servants? Under the law, where monetary interests are involved, this is universally conceded. The bond must be given for the proper execution of the trust. Should this pertain to the professions? We complain of lawyers as a class, and say they too often play the part of the fox in the fable, which divided the cheese for the ravens; but the public confides to their keeping comparatively a minor trust, however great the property-interest; yet, who would think of employing a lawyer who had not been examined for admission to the bar? Correctly speaking, without such admission he is not a lawyer.

We feel that he who ministers to us in sacred things must be touched with the divine afflatus of his calling; yet, even with such prerequisite, who would consider this all? He rather must be drilled and schooled by long years of study before he can worthily become the public teacher, the wise, trusty adviser. Not a man attending the meeting of our great Association, held here this present week, but has called to his aid the motor forces of steam, this modern miracle of transforming, civilizing power of our century; yet, who would have invoked Heaven's blessing on his journey, or have quietly retired to his slumbers in car or cabin, unless he had reason to believe a trusty, trained brain and arm held guidance over this force mighty to destroy as well as serve? The attorney-at-law practises in open court, under the scrutiny of an opponent and the direction of a judge, yet these are not considered sufficient safeguards to the noble profession counted a synonyme of justice; each applicant to practice must be examined, and, after admission, complaints of improper conduct made against an attorney-at-law are inquired into, and, if found of sufficient importance, his license may be revoked. The physician holds, on the contrary, a far different relation to his client. Assuming that both clients are equally ignorant upon the subject for which they seek advice—the one, at the worst, is under the influence of his passions,

the other of disease; the one capable to judge with his usual wisdom the general conditions of the problem, the other in a possible perversion of every faculty. The physician advises for the most part in the solitude of the sick-chamber, unwitnessed by opposing counsel, unwatched by learned judge. The one advises upon questions of necessity of a lower order and value, the other takes into his keeping the vital interests of life itself. Therefore, granted that the average honor and moral restraint are equal in both professions, the deduction seems clear that the medical practitioner, if either, should be held by law under the closer supervision. This question is by no means new and only theoretical. Testimony from experience, actual, long-continued practical working of law is abundant. The older civilizations of Europe have for centuries held in careful control the welfare of the people, by allowing no one to assume the title of "Doctor of Medicine" and practise his profession until he has given evidence of his fitness therefor by examination before a proper tribunal. I shall never forget my indignation when I found, during my residence in Germany as a post-graduate student, that not a single apothecary in the great city of Berlin was allowed to fill my prescription given a sick friend. I fear I contrasted unfavorably the royal mandates of Prussia with the wider democratic liberties of our own republic.

The Dominion enacted a wise law for the regulation of the practice of medicine, which has continued in most satisfactory operation. This led to the inauguration of a general movement in the United States, which has already resulted in more or less efficient legislative supervision in the larger number of our States. A careful digest of these laws has been made by Dr. John H. Rauch, of Illinois, and published in a very convenient hand-book. The American Academy of Medicine was organized for the especial purpose of elevating the standard of medicine in America. The very efficient secretary, Dr. Richard J. Dunglison, of Philadelphia, has made careful annual reports of the operation of these laws in the various States. The exceedingly valuable work accomplished in Illinois and West Virginia, chiefly through the enterprise and indefatigable labors of the secretaries of the State boards, Drs. Rauch and Reeves, is known to you all. Several of the other States are

agitating the question the present year before their respective legislatures. Prominent among the number is our old commonwealth of Massachusetts.

(To be continued.)

LEPROSY.—It is calculated that in India alone there are 100,000 lepers, with very few asylums for refuge and hardly any recognized medical aid. In Madagascar, throughout Africa, in Greece, along the Italian coast, in Spain and Portugal, and as far as Norway the same hideous scourge prevails. The general feeling among expert investigators is that, like a good many other scourges, leprosy is either to a great extent caused or intensified by food conditions and unsanitary habits and customs. The writer in the *Nineteenth Century* remarks that, though the disease has been prevalent from the earliest days, no certain cure has yet been discovered for it, and with men of science its communicable character is still an open question, or whether it is contagious or hereditary, due to insufficient, bad food, climate or dirt, to lack of meat, absence of vegetable diet, to use of salt-fish food, or to want of salt. It once desolated Europe, but now, except in isolated districts, is unknown here.—*London Sanitary World.*

MIRTH AND JOLLITY try the spirit, of what sort it is: the baser kind shows itself by the coarse laugh and vulgar joke. It takes a genuine soul to throw off all restraint and yet be refined, to jest and yet be a gentleman, to laugh and yet be a lady. A summer vacation often brings out traits that a restrained city or village society would never prove, and an acquaintance is presented in an entirely new and unexpected light. Even a day "out" on a picnic or an excursion shows people in a new character. Look out, then; if you are genuine, you can laugh and be merry; but if you are not, keep still and stay at home.

HONORS.—The friends of Dr. Irwin A. Watson, the efficient secretary of the State Board of Health of New Hampshire, and secretary of the American Public Health Association, will be pleased to learn that Dartmouth College has bestowed upon him the well-deserved honors of A.M. and LL.D.

EDITOR'S TABLE.

REST AND RECREATION.

REST lies at the very basis of vital development and growth.

In plants as in animals all have their periods of rest and activity. In some plants the periods are marked by the seasons of winter and summer, and in others by periods which appear to be wholly independent of the seasons; in others, again, by light and darkness—day or night; and in others still by certain hours of the day or night, as indicated by drooping their leaves or closing their flowers, and with such certainty as to mark the passing time with the regularity of clock-work, such as the "four-o'clock" and the "go-to-bed-at-noon."

In the lower animals, all know how eagerly rest is sought, especially after extraordinary activity; or for recuperation and repair, when suffering from disease or injury. And all animal trainers know that the highest degrees of intelligence in animals are attainable, not by continued and wearisome exercise, but by well-appointed intervals of rest to strengthen the powers of application.

But there is no need to dwell upon such illustrations.

Who that does not know how the ear wearies under continued intense sound? the eye by steadily gazing? the overpowering effect of too long exposure to odor? the painfulness of taste or touch—even though agreeable at first—if too long persisted in? These are illustrations of the necessity of rest for those organs mainly under the control of the will.

Of those organic functions not under the control of the will, none are more marked than those which are absolutely essential to the maintenance of life—the circulation of the blood and respiration.

While the circulation of the blood never wholly ceases from the beginning of life to the end, the heart, by which the blood is propelled, rests about one-fourth of its time—between the beats. And the lungs, by which respiration is kept up every minute from birth until death, repose about one-third of their time—between each inspiration and the succeeding expiration.

The stomach requires periods for recuperation after the process of digestion for greater or less length of time, depending upon the degree of labor it has performed; and after special derangement from unwholesome food or drink most persons have learned by experience to know special prolonged rest is required by the stomach to regain its accustomed strength. And so may be traced the periods of rest required by all the organs—none labor incessantly.

But more than all these, when, as a penalty for his disobedience, it was ordained that man should live by "the sweat of his face," the greatest of earthly blessings was left him as a reward for his labor—the blessing of rest in sleep; nature devoting her best efforts during this period to repair the exhausted powers.

That the Creator has implanted in man an endowment so beneficent as sleep, by which he is enabled to sustain his existence under the labor and vicissitudes inseparably connected with his living existence, is an evidence of His merciful love which should impress every thoughtful mind with a sense of its importance and significance.

Sleep is a synonyme for mental rest—the period when the brain rests from the exercise of its functions, and the will-power reposes. Meanwhile the involuntary functions—the circulation of the blood, respiration and nutrition; and the secretions of the skin, liver and kidneys—pursue their course. The organs by which these functions are performed all taking their periods of rest, however, with the same degree of regularity as when the brain is active, but with less disturbance and proportionally increased benefit.

But rest, in its highest and most significant relations to man, was implanted as a law in his nature when God rested from his labor on the creation of the world. By this act all the physical benefits of rest were sanctified and elevated to that spiritual privilege befitting a creature made in the image of the Creator and capable of holding fellowship with Him. And all along through the ages the benefit of at least one day's rest out of every seven, though frequently called in question, has been abundantly illustrated whenever competently examined.

In reply to inquiries made by an English commission instituted in 1832, a report was made to Parliament in 1853, giving

the testimony of 641 medical men, and a great number of medical societies, physicians, physiologists, political economists and managers of industrial establishments, showing that in the case of men engaged in ordinary bodily or mental labor the rest of the night does not fully restore the waste of energies during the day, and that to maintain a condition of vigor a supplementary rest of not less than one day in seven is required to make up the deficiency.

This conclusion is confirmed by the experience of France during the Revolution, when the decade was substituted for the week, and every tenth day was devoted to rest and recreation instead of every seventh. It was found to be insufficient —the people were less capable of accomplishing their labors.

Indeed, the need of a weekly day of rest has been found, by all scientific men who have ever carefully examined the question, to be necessary for the maintenance of the highest standard of physical and mental vigor.

Recreation is akin to rest, in so far as it affords complete relief from strain of the too continuous application of physical or mental energy in one direction. The division of the day into three periods of eight hours each, for labor, recreation and rest, is found to be, by all practical observers, that which is most promotive of the best conditions of human welfare. And no matter what the occupation, if it is of a kind to exclusively employ the faculties in one direction for more than eight hours out of the twenty-four daily, the physical and mental powers will not only ultimately weary of that pursuit, if the overtax be persisted in, but they will become impaired for any other.

This division of time, however, for the ordinary staid pursuits of common life, is no criterion for those exciting and intense occupations common to the "Stock Board" or the "Exchange." Three or four hours' occupation under the stress which commonly obtains in such places inflict an amount of wear and tear to the powers of the system out of all proportion to most other pursuits, and should be compensated for accordingly by such rest and recreation as will most effectually divert and reinvigorate the powers from day to day.

Moreover, the intensity of application common to the school-room bears no relation to the division of the day into three parts for the ordinary avocations of life—the teacher only

bears that relation, or should, of not more than eight hours out of the twenty-four daily for five days in the week. But the time of the pupils is divided into applications of thought of various degrees of intensity, which, taken in the aggregate, too often approaches the amount of pressure common to the stock board in minds much less able to bear it; above all, in those seasons of cramming for the annual show familiarly known as "commencement day."

Half hourly divisions of time from one study or recitation to another, and each one requiring such intensity of application as will show competency in all, for periods of two hours or more without recreation, is more worthy the name of stunting the intellect than of educating it, and deserves the reprobation of every true friend of education. Children under eight years of age, if sent to school, should, under no circumstances, be confined to their seats and books for more than half of their time, in alternate periods, half hourly, between study and recreation; from eight to thirteen years of age, one-third of the time, or half an hour after each hour's devotion to study; and for those who are older, never less than one-fourth of the time should be devoted to recreation, and always, when weather will permit, out of doors.

Physical education should go hand in hand with mental education, for both sexes, and it is the more essential in the inverse ratio to the age of the pupil; and in all cases where practicable physical education should be taken in the open air.

It is too commonly the case, that physical exercise is looked upon as mere relief from mental exercise, and not regarded as it should be—a contribution to mental culture as well as bodily, increasing the vigor of the mind and promoting its power, and contributing to the strength and beauty of the body. There should be more frequent sessions, shorter periods of confinement to school-rooms, and more "play."

Of the various kinds of recreation and amusement, of which there is no lack, as diversions for business men, factory operatives, laborers, housekeepers, writers, teachers, students, pupils of public schools—of all pursuits—there is no need to particularize, farther than to state that whenever practicable they should be in the open air, and whenever this is not practicable in well-ventilated apartments.

PURIFICATION INSTEAD OF QUARANTINE.

THE revolution which Dr. Holt has accomplished in the process of external hygiene at New Orleans is eminently worthy of imitation at maritime ports everywhere. July 3d, he appears to have practically demonstrated the efficiency of his new apparatus for driving sulphurous acid fumes, steam, or any other vapor, through the inmost recesses of a vessel, to the complete satisfaction of health officers Thornton, of Tennessee; Swearingen, of Texas; Professor Chaillé, of the National Board of Health; and a number of other competent observers, including several of the most distinguished physicians and merchants of New Orleans.

Five years ago we took occasion to state:

"It has been proven by experiment that the amount of sulphur necessary to produce sulphurous acid fumes sufficiently concentrated to kill low organisms should not be less than about two pounds for every 1,000 cubic feet of space with dry surfaces. To be effectual in the disinfection of bilge water, and the filthy mud in the bilge and limbers of an infected ship, and to penetrate the rotten wood surroundings saturated with dampness common to these conditions in wooden vessels, it is necessary to bear in mind that one volume of water will take up over thirty volumes of sulphurous acid gas. Therefore, *no less than three pounds of sulphur should be sublimated to every* 1,000 *cubic feet of space* circumscribed by the damp surfaces of an infected ship, and the vapor should be enclosed in the space as tightly as possible for not less than twenty-four hours. Moreover, in the use of this means, pains should be taken to *expose* the infected material to the sulphur fumes. A sufficient amount of dunnage, flooring-boards and limber-strakes should be removed to allow of the utmost penetration of the acid under the flooring and between the timbers. And, for manifest reasons, the infected filth should be disinfected *before* removal—before the washing and scrubbing; and the cleaned surfaces subsequently, in extreme cases.

Thus applied, we believe in the efficiency of sulphurous acid and chlorine. But we do not believe it involves less trouble, less delay, or less expense than steam, which is more certain in its effects; no infective material having thus far been known

to revive after having been certainly exposed for three hours to a degree of heat approximating the temperature of boiling water."*

This was said in virtue of practical knowledge for a considerable period, and in criticism of less efficient methods, even by the use of the same means. It is gratifying to know that health officers and others, even including the National Board of Health at that time, who persisted in the sufficiency of *two* pounds of sulphur to the 1,000 cubic feet of space, now require three; and that those who had never used steam, nor had any practical experience whatever in its use, assumed to teach the impracticability of its application, of its injury to the wood-work, and of its inefficiency, because, forsooth, certain germs indigenous to hot springs would stand a temperature of upwards of three hundred degrees, have, some of them at least, changed their minds. The world moves, and with it quarantine. With a few more accessions to the health service of such men as Joseph Holt, who have the courage of their convictions, quarantine will ere long be among the things of the past, and aggressive sanitary measures will be the order of the day whenever and wherever the lurking places of "disease germs," under whatever name, are supposed to exist.

DRY AIR has but little capacity for heat; hence, when it is at rest, even in extremely low temperatures, it conducts away very little heat from the body; and when used for disinfecting purposes, it is, for the same reason, much less destructive to *materies morbi* of all kinds than moist heat of less intensity. There has been no well-authenticated case of the inefficiency of steam heat at the temperature of boiling water; or of boiling water itself having failed as a disinfectant, when thoroughly applied for two hours.

THE SANITARY CONVENTION AT YPSILANTI, MICH.

GREAT interest was manifested in the Ypsilanti Sanitary Convention, which was held June 30 and July 1, 1885, under the auspices of the Michigan State Board of Health. The physicians of Ypsilanti, the professors of the State Normal School, and a large number of other prominent citizens of that

* THE SANITARIAN, vol. viii., p. 133.

place were in constant attendance. About twenty physicians and health officers from other places were also in attendance.

C. L. Yost, mayor of the city, opened the convention with a brief address of welcome, in which he said, that "in times past we have been honored with the presence of other assemblages, for consultation upon religious, political, medical, or other interests; but this is the first time that disinterested philanthropists have come to us to discuss those great practical questions relating to the guardianship of public health." He thought that the adage, "an ounce of prevention is worth a pound of cure," was the inspiring motive that brought them together. Their city was more than usually blessed with conditions for good health; still they recognized the value of detailed instruction in sanitary subjects. Sanitary science is in its infancy, and all attempts to further, it and bring intelligent attention to its teachings, should be welcomed by thinking men everywhere.

Edwin Willits, President of the Michigan State Agricultural College, presided over the convention; and in his address dwelt upon the value of human life considered from an economic standing-point, as worked out by eminent statisticians. A number of people who should produce $3,000,000 when in good health, could produce when not in good health only $2,000,000. Here is a loss of one-third, much of which could be saved by applying the simplest sanitary precautions. It is the duty of a community to keep these human earning-machines in good condition of health or earning-capacity, even from economical motives. A community has the legal right to do this. We want pure water and plenty of it, clean streets, cleansed sewers and drains, swamps drained, cesspools filled up; and we should not count the cost on our fingers. The crowning labor of our medical science is the warding off of disease. Given by heredity a sound condition, pure air, pure water, and nutritious food ought to guarantee to every human being, as he puts his foot on this earth, his threescore years and ten, with which assurance he might plan the labors of a well-rounded life.

Rev. Dr. Woodruff, of Ypsilanti, read a paper on "The Moral Effect of Sanitation." He told of the importance the ancient Jewish people gave to sanitation; and in a forcible

way pointed out its power in elevating man morally as well as socially and physically. He thought the present attention given to sanitary matters is not temporary. The reform has come to stay.

Professor Austin George, of the State Normal School, spoke on "Sanitary Needs of School-buildings and Grounds." 1. School-sites should be on a gravelly soil, a natural knoll, admitting thorough drainage. 2. Wells should not be nearer than one hundred feet to the out-houses. 3. Basements should be high, with free circulation of air under ground-floors. School-rooms should contain two hundred and fifty cubic feet of air-space for each child. The light should come in over the left shoulder. The windows should go to the ceiling, and within three and one-half feet of the floor. The blackboard should be on the side of the room opposite the windows, and never have a glossy surface. 4. The simplest heating and ventilating apparatus is the hot-air furnace, and for small buildings the jacketed stove. The foul-air outlets should be ample, and at the floor-level. With any system, the rooms should be frequently flushed with fresh air through windows and doors. The temperature should be kept at 70° Fahr., not by teachers' sensations, but by thermometers. 5. Perfect desks and benches (not yet made); they should be adjustable, to suit different sizes, and be constructed with reference to the curves of the body. There should be foot-rests, which could be raised and lowered until each pupil is made comfortable and able to take a healthful position. Many spinal complaints and pulmonary diseases are produced by improper desks. 6. Means for drying wet wraps should be provided. 7. Precautions against fire should be had, especially in the heating apparatus and chimney. 8. "Inasmuch as the State educates the children, and compels their attendance in public buildings, the State should see that the children are not subjected to any preventable cause of disease."

This paper called out a long discussion, participated in by Dr. Avery, of Greenville, President of the State Board of Health; Professor Vaughan, of Ann Arbor, member of the State Board of Health; Professor McLouth, of the State Agricultural College; Professor Langley, of the Michigan University, and many others.

Dr. Bion Whelan, of Hillsdale, Mich., spoke on "Sanitation in Small Cities." The water-supply should be guarded from contamination from cesspools and vaults. If we could not have sewers, the most feasible plan for disposing of garbage is to divide the city into districts and have it removed by licensed scavengers. Sanitary science should be taught in schools. The women should be taught sanitary needs, as much of sanitary work falls upon them. The nature of contagious diseases, and means for their restriction, should be known by all.

Dr. J.K. Kellogg, of Battle Creek, member of the State Board of Health, treated of the "Disposal of Slops and Garbage," illustrating by use of the blackboard. He pictured in a graphic way the ordinary condition of back yards, as contrasted with front yards. He prefaced his subject proper with a brief description of bacteria and other low forms of microscopic life, and showed the relation of these to decay, no decay being possible without their intervention. He showed the importance and usefulness of certain sorts; the dangerous nature of others. He spoke of flies in relation to filth. They are a very strong indication of the presence of filth, and consequently of germs, and it is even believed that the germs of certain diseases may be spread by them. Whenever a house is full of flies, you may be certain that slops or garbage of some sort has been allowed to accumulate about the premises. He stated that the air about cesspools, foul drains, and other filthy places is usually swarming with micro-organisms, and he believed that, even if such germs were not the direct cause of certain diseases, the continued breathing of such air predisposes thereto. All sources of filth should be carefully and speedily removed from the habitation and its vicinity. Garbage can be reduced to a minimum by a little attention to domestic economy. Much food that becomes garbage through carelessness could be turned into good use if not neglected. Even after due care, however, some refuse will remain. So far as possible this should be burned. That is the best method of disposal. Where it is impracticable, a watertight, covered receptacle can be used for receiving such refuse, which should be removed frequently by a paid scavenger, or otherwise. Slops should not be thrown upon the ground, into open drains, or

into cesspools in the yard. He had known of frequent instances in which wells and cisterns were contaminated from the seepage of foul privies, drains, and cesspools. If slops must be poured on the ground, set off a portion of the back end of the garden, and distribute the slops on different parts of it on alternate days, giving in this way some opportunity for the soil to oxidize the organic matter. Slops containing excreta from contagious diseases should be thoroughly disinfected.

Charles R. Whitman, of Ypsilanti, one of the regents of the Michigan University, read a paper on the "Limitations and Duties of Local Boards of Health." The powers and duties of local boards of health should be as follows:

1. To ascertain the causes of sickness and of death, and from time to time the prevailing diseases among all classes.

2. To prevent or mitigate diseases, especially zymotic or epidemic, endemic, and contagious diseases.

3. To effect the periodical or special vaccination of the inhabitants.

4. To ascertain, prevent, and remove or abate nuisances dangerous to public health.

5. To prevent the introduction of malignant, infectious, or contagious diseases, and to isolate persons afflicted or believed to be afflicted with such diseases.

6. To establish, locate, and manage hospitals for persons having contagious diseases.

7. To prevent the sale of any article for food or drink which is unwholesome.

8. To enforce these regulations by a sufficient penalty.

Mr. Whitman said that the radical defect in the law defining the powers and duties of local boards of health is the lack of a general law forbidding evils and imposing penalties. Such a law should be enacted, and it should be as sweeping and as readily enforced as is the criminal law. He thought that the subject of sanitation should become one of education in the schools, so that the future citizen, architect, and physician may be established in principles of sanitation.

After a thorough discussion of this paper, participated in by Professor A. B. Palmer, of the University of Michigan, and many others, it was voted that Mr. Whitman be requested to draw a bill suitable for presentation to the Legislature, framed

to cover the question under discussion, and suited to correct existing defects in the present law. The bill is to be published in the Proceedings of this convention.

Dr. A. F. Kinne, in a paper on "Sources of Malaria in Ypsilanti," took the ground that malaria is caused by a malarial germ, native in certain soils and waters. Boards of health should require that the basements and sub-floor spaces be thoroughly ventilated; and no mill-dam owner who used water should be allowed to keep the pond much less than full.

Dr. O. W. Wight, health officer of Detroit, spoke on the "Prevention of Communicable Diseases." He showed clearly the contagious nature of those diseases; the great and unnecessary loss of human life resulting therefrom; and how they were best restricted, citing cases from his own long experience in Milwaukee.

STATE AND LOCAL BOARDS OF HEALTH REPORTS.

MICHIGAN.—At the quarterly meeting of the State Board of Health of Michigan, held July 14, 1885, at its office in Lansing, the following members were present: Drs. Avery, Lyster, Hazlewood, Vaughan, Tyler, and Baker.

The Secretary read a report of work during the quarter ending July 13, 1885, the leading features of which are as follows: The weekly and monthly bulletins of health in Michigan, and the meteorology and mortality reports, had been prepared from the numerous reports received, and sent out as heretofore. The footings and computations on meteorological registers, and on the sickness reports and tables, have been carried on; and the meteorological computations for the year 1884 nearly completed ready for tabulation. The office had made large distributions of documents relative to the work of health officers, and to the restriction of contagious diseases, to newly appointed health officers and to others, especially in localities where such diseases have occurred. The Proceedings of the Sanitary Convention at Lansing have been edited, sent to the printer, and the proof on most of it read. Articles on meteorology and sickness in Michigan in 1883 have been completed from data previously collected. Data collected by the office relative to scarlet fever in Michigan in 1884 have been compiled; and also that relative to diphtheria. A map has been

prepared, showing the distribution of diphtheria in Michigan in 1884. Small-pox has been present in Michigan during the quarter: at Bellevue, Eaton County; Alba, Antrim County; Battle Creek, Girard Township, Branch County; and South Haven. The outbreak at South Haven was confined to those first exposed, and has been stamped out after nine cases occurred, with one death. The infection at South Haven was from a German immigrant, who sailed from Bremen, April 12th, on the ship Donau, North German Lloyd line. The immigrant was broken out with small-pox when he reached South Haven, April 27th, and might have been quarantined *en route*, and the outbreak thus confined to the one case. All infected persons were at once vaccinated by the health officer, but the virus was not good, and thus precious time was lost. This outbreak is but another added to the many constantly recurring outbreaks of communicable disease in Michigan and the Northwest, to which a faithfully executed immigrant inspection service, carried on by the National Government, would put an end, or greatly lessen. At the present time, so far as known, there is not a case of small-pox in Michigan. Typhus fever was reported at Grand Rapids, Mich., during the week ending July 4th. Cholera is spreading with great violence in Mediterranean Spain, hundreds dying daily. It was reported present in Marseilles over a month ago, and July 10th, at Toulon. A strange and fatal disease, believed to be cholera, was also reported from Portugal. Asiatic cholera will probably reach this country this year or next year, and the State Board of Health has prepared to meet the emergency by many lines of work as best it could. About twelve thousand copies of the document on the best method for the prevention and restriction of cholera were distributed to the people last year. The recent distribution of documents relative to typhoid fever, and especially the correspondence with health officers throughout many parts of the State on the best method of restricting this disease, has done something in the way of drill in the two important methods applicable in case of cholera, the disinfection of all bowel discharges and the protection of the purity of the water-supply. Much, however, remains to be done in many localities in the way of abating nuisances and in protecting wells from sources of contamination. The Legislature has

passed an act granting to the State Board of Health power to establish a system of inspection of immigrants and travellers, and the disinfection of baggage, etc., liable to be infected with cholera or other dangerous communicable disease; but the act was not given immediate effect, and so does not take effect until September 18, 1885. The contingent appropriation to enable the Board to carry on the inspection, etc., provided for in the act, can be used on or after September 18th, in case the Governor thinks its use is necessary. Reports relative to examinations during this quarter, by this Board, of plans for buildings, have been sent to the boards governing the Michigan Asylum for the Insane at Kalamazoo, the Northern Asylum for the Insane at Traverse City, and the State Reform School at Lansing. Over six hundred and fifty pages of the letter-book have, been used in copying the most important parts of the correspondence, and other branches of the office-work have been large during the quarter, and the Legislature made additional demands upon the time of the office.

The Board spent much time in examining plans, as required by law, of a proposed new double cottage at the Reform School at Lansing, a building designed to accommodate 100 pupils. The plans were submitted by the architect, Mr. William Appleyard, of Lansing. The Board approved the plans for ventilating and warming the second and third floors. With reference to the first floor the Board recommended, in order to avoid the settling of dust in the registers, that iron hoods be placed over the fresh-air inlets, which enter the school-rooms through the floor, and that two additional foul-air outlets, each of a size equal to that of the present outlet, be provided for the two school-rooms—one in the west wall of the west room, and the other in the east wall of the east room—and that these shafts be heated by steam-pipes. Each of these two school-rooms is 30×40 feet, 13 feet high, designed to accommodate fifty pupils. Fresh air is brought into each room by two shafts having an area of 512 square inches. The foul-air shaft for each room is only one-half the size of the inlet pipes, the area being 256 square inches. The recommendation by the Board of Health is, that the outlets equal the inlets in area. The method of heating, and of taking fresh air

into the building was approved, and also the making of the basement-floor of cement trowelled smooth.

The Secretary presented a printed statement in regard to the charges made by a minority of the legislative committee on investigation, and asked that a committee be appointed to fully investigate the conduct of the office and the several laws governing the action of this Board. Drs. Hazlewood, Vaughan, and Tyler were made such a committee.

The Secretary read a résumé of the work of other State boards of health, and of city boards of health; also a report in regard to recent legislation in Michigan in regard to subjects relating to public health. The act passed by the Legislature appropriating $10,000 as an epidemic contingent fund was read by the Secretary, and the Board appointed Drs. Barker and Lyster a committee to frame rules under that law, and submit them to the members, so that they can be in readiness in case of threatened occurrence of cholera, small-pox, etc. The Board authorized the Secretary, should cholera appear in Michigan, immediately to proceed to the place, or send a competent person, to confer with and aid the local board in restricting the spread of the disease; and it was informally agreed that if cholera appeared in the United States the President of the Board should at once call a meeting. The revision of the document on restriction of cholera, issued by the Board in 1884, and the printing of 20,000 copies for distribution, were ordered.

The Board directed that the names and addresses of health officers in Michigan be printed in pamphlet form.

The subject of typhoid fever was discussed, and the Secretary was instructed to issue a circular designed to collect information from health officers in localities where typhoid fever occurs; and a committee was appointed to prepare and have printed a document giving methods of preventing and restricting typhoid fever, the document to be distributed in localities where it occurs.

The Board considered the subject of the carrying of infected articles and bodies dead from contagious diseases, and circulars relating to that subject were ordered printed and sent to health officers and to railroad companies.

THE NEW HAMPSHIRE State Board of Health is engaged in the very praiseworthy work of inspecting the railway stations, camping-grounds, and other places of public resort throughout the State, with a view to destroying, and consequently preventing, inviting conditions for the planting and propagation of cholera, or any other disease-germs. A like sanitary inspection of all the public-school buildings is also in contemplation, and will be executed before the opening of the schools for the fall term. It is by just such work that the largest amount of good is done for the protection of the public health at the least possible public expense.

THE NEW YORK STATE BOARD OF HEALTH has been unfortunate in so asking an increase of appropriation for the prosecution of its work that the Governor could not approve of the measure. This has given rise to unjust criticism of the Governor, whose duty it was to ascertain the truth of the matter. It appears that the Board, considering the amount of the appropriation already made insufficient to meet the expense of continuing all of the work it had undertaken, and other work in contemplation, instead of clearly so stating, and asking an increase of the appropriation for purposes in view, had a bill prepared to meet a "deficiency," which the Governor found did not exist. This was reason sufficient for his refusal to sign the bill.

A clear statement of the case at the outset, and a proper title to the bill, indicating the insufficiency of the appropriation for work necessary to be done for the promotion of the public health, instead of a misleading title, would probably have secured the Governor's approval.

PENNSYLVANIA is at last ranked among the States which have taken action for the preservation of the health of the people. If the State Board of Health shall accomplish what is reasonably expected from it, the Plymouth epidemic will not have raged in vain. Sanitary science apparently cannot advance in communities ignorant of its importance, except with the aid of object-lessons on a grand scale, which may be properly used to "point a moral," even if they do not "adorn a tale."

The Governor has appointed the following to constitute the Board: Colonel William Ludlow, Benjamin Lee, M.D., Jos-

eph F. Edwards, M.D., Pemberton A. Dudley, M.D., of Philadelphia; E. W. Germer, M.D., of Erie; and J. W. McClellan, M.D., of Pittsburg.

DEATHS IN NEW YORK for week ending July 18th, 1,019; of which 613 were of children under five years of age. Twenty-seven prostrations from heat were reported, July 18th, of which five terminated fatally. Thermometer, 90° to 95° in the shade.

IN BROOKLYN, during the week ending July 11th, there were 585 deaths, 415 of which were of children under five years of age. The mean of the highest readings of the thermometer for the week was 84.71°. For the week ending July 18th, the number of deaths was 483. Prostrations from heat, July 18th, 17, of which five terminated fatally.

RICHMOND, VA.—Annual report of the Board of Health for 1884:

Births registered, 1,874—white, 1,046; colored, 828. Still-births, 145—white, 55; colored, 90.

Marriages, 619—white, 377; colored, 242.

Deaths, 1,904—white, 826; colored, 1,078. Rate of mortality per 1,000 (75,000—white, 42,000; colored, 33,000), 25.38—of white population, 19.66; colored, 32.66. Of the total, 449 were children under five years of age; 463 were caused by zymotic diseases, the chief of which were—typhoid fever, 120; diarrhœal diseases, 168; inanition, 35; whooping-cough, 19; cerebro-spinal meningitis, 15; remittent fever, 14. Of constitutional diseases, 242, or 12.7 per cent., were caused by consumption.

The sanitary condition of the city, upon the whole, may be pronounced good; yet there are some open sewers into the ravines of the precincts, unpaved and filthy alleys, and a persistent retention of filth-stowage recesses by some citizens, which are fruitful sources of such diseases as now obtain, and a menacing source of danger in the event of cholera or any other epidemic.

WILMINGTON, DEL.—Reports of the president and secretary of the Board of Health for 1884: Population, 53,000; deaths,

1,190. *More than half*, as registered, were caused by zymotic diseases; and this is all the more significant when taken in connection with resolutions adopted by the Board of Health against a pending ordinance for sewering the city, because the manner of doing it (not the system) was not in accord with the views of the Board. The ratio of deaths per 1,000 of population, on the basis of the enumeration given, was 20.6, leaving the impression that the population is over-estimated, or all the deaths are not reported, as so large a proportion of deaths from zymotic diseases, in any community, is suggestive of a larger mortality in the aggregate. Wilmington has had a water-supply many years without sewerage, and the soil is exceedingly filthy, giving rise to and promoting the great preponderance of zymotic diseases stated, and maintaining a condition of receptivity for infectious diseases of every kind scarcely equalled by any other city in the country.

VITAL STATISTICS OF IMMIGRATION.

NAMES OF STEAMERS, DATE OF ARRIVAL, PORT OF DEPARTURE, NUMBER OF PASSENGERS, NUMBER OF DEATHS AND BIRTHS DURING THE VOYAGE FROM EUROPEAN PORTS TO NEW YORK, FOR THE MONTH OF JUNE, 1885.

Arrival.	Vessels.	From.	Passengers.	Deaths.	Births.
June 5,	Bohemia,	Hamburg,	1,162	3	2
" 6,	Wieland,	"	683	1	
" 6,	Fulda,	Bremen,	1,290	1	1
" 6,	Germanic,	Liverpool,	779	1	
" 11,	Rugia,	Hamburg,	723	2	
" 13,	Noordland,	Antwerp,	709	1	
" 14,	Donau,	Bremen,	894	2	
" 14,	Ems,	"	1,093	2	
" 14,	California,	Hamburg,	548	2	
" 16,	Gallia,	Liverpool,	693		2
" 16,	Rhaetia,	Hamburg,	1,343		1
" 20,	Eider,	Bremen,	650	2	
" 24,	Werra,	"	722	1	
" 26,	Hekla,	Copenhagen,	398		1
" 26,	Hammonia,	Hamburg,	1,095	1	2
" 28,	Australia,	"	466	1	
" 28,	Elbe,	Bremen,	658	1	
			13,916	21	9

MORTALITY STATISTICS IN THE UNITED STATES.

MONTH OF MAY, 1885. Correspondents under this head will please send reports promptly.	Total Deaths.	Deaths under 5 years.	Lung Diseases.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
Burlington, Vt., 12,500	...	...	...	..	..	..	..	..	..	..	....
Boston, Mass., 427,940	...	...	...	..	..	..	..	..	..	..	....
†Lowell, Mass., 68,500	59	25	11	1	2	..	..	3	..	..	11.9
†Worcester, Mass., 58,295	89	15	30	2	..	..	..	..	..	1	20.1
Providence, R. I., 120,000	157	37	57	5	..	1	1	4	..	3	15.7
New Haven, Ct., 75,000	120	40	38	2	1	2	3	..	..	..	18.4
New York, N. Y., 1,397,395	2,937	1,110	917	181	71	84	24	75	..	83	25.5
Brooklyn, N. Y., 665,602	1,205	429	415	50	29	40	10	18	..	35	21.5
Long Island City, N. Y., 21,000	36	12	10	1	..	1	1	..	..	1	20.5
Yonkers, N. Y., 22,000	30	5	7	1	..	..	..	1	..	1	16.3
Albany, N. Y., 95,000	177	62	59	8	1	14	1	5	..	2	22.3
Cohoes, N. Y., 20,000	26	8	11	4	..	..	..	2	..	..	15.6
Troy, N. Y., 60,000	114	26	51	5	..	..	..	1	..	..	22.8
Syracuse, N. Y., 65,000	82	24	30	4	1	..	..	4	..	..	15.1
Utica, N. Y., 40,000	77	20	23	3	..	..	..	2	..	2	23.1
Auburn, N. Y., 26,000	33	5	13	..	..	..	..	2	..	..	15.2
West Troy, N. Y., 13,000	19	3	11	..	..	..	..	1	..	..	17.5
Rochester, N. Y., 101,000	159	38	54	2	..	..	..	..	..	1	18.9
Kingston, N. Y., 20,000	28	7	9	..	..	..	..	3	..	..	16.8
Newburgh, N. Y., 20,000	26	9	14	.	..	..	..	1	..	..	15.8
Poughkeepsie, N. Y., 20,207	35	7	13	..	..	1	..	1	..	..	20.7
Oswego, N. Y., 24,000	28	8	10	1	..	..	..	3	..	..	14.0
†Hudson Co., N. J., 209,000	405	134	132	24	15	1	1	6	..	..	25.2
Paterson, N. J., 57,000	91	35	32	4	..	..	..	2	..	1	20.0
*Philadelphia, Pa., 949,432	1,971	727	553	111	40	32	17	41	1	30	21.5
*Pittsburg, Pa., 180,000	322	109	89	23	15	7	2	17	..	..	19.1
Erie, Pa., 36,768	...	...	...	..	..	..	..	..	..	..	....
Wilmington, Del., 53,500	60	26	18	1	1	..	..	1	..	1	13.3
§Cincinnati, O., 325,000	202	77	57	7	7	1	..	2	..	13	16.1
Cleveland, O., 200,429	...	...	...	..	..	..	..	..	..	..	....
Toledo, O., 52,000	74	17	11	6	..	..	..	3	..	2	18.5
Detroit, Mich., 150,000	200	36	44	21	4	1	..	9	..	4	15.6
*Rock Island, Ill., 11,650	18	5	3	3	..	..	..	..	..	..	16.0
Chicago, Ill., 630,000	1,136	557	262	63	20	9	12	77	..	84	21.6
St. Louis, Mo., 400,000	549	173	176	18	9	10	1	38	..	8	16.4
Milwaukee, Wis., 150,000	221	66	49	16	..	..	1	5	..	4	16.6
Salt Lake City, Utah, 25,000	...	...	...	..	..	..	..	..	..	..	....
San Francisco, Cal., 235,000	512	188	121	56	..	26	1	16	..	20	27.8
Minneapolis, Minn., 100,000	106	50	34	8	2	2	2	7	..	1	12.7
St. Paul, Minn., 100,000	90	34	17	13	..	..	..	2	..	2	10.8
*Baltimore, Md., 408,520	629	193	194	22	9	..	5	15	..	8	16.1
Dist. of Columbia, 200,000	388	124	128	13	7	1	3	6	..	5	23.2
Richmond, Va., 73,400	121	40	25	4	2	..	..	..	..	3	19.3
*Lynchburg, Va., 23,000	40	13	7	..	..	..	..	1	..	1	18.0
*New Orleans, La., 234,000	736	253	134	20	5	3	1	26	..	80	28.4
Nashville, Tenn., 50,000	88	34	28	1	..	1	1	2	..	1	17.5
Mobile, Ala., 31,295	71	23	15	..	..	..	..	1	..	2	27.1

* 5 weeks ending May 30; † 4 weeks; § 2 weeks.

MORTALITY STATISTICS ABROAD.

FIVE WEEKS ENDING MAY 30, 1885.	Total Deaths.	Deaths under 1 year.	Bronchitis and Pneumonia.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Typhoid and Typhus Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
London, 4,019,361.....	7,602	1,636	1,336	147	60	438	272	57	187	109	19.5
Liverpool, 573,202.....	1,324	313	294	9	12	111	35	14	2	17	25.8
Glasgow, 517,941.....	1,311	280	283	14	14	67	62	12	..	27	26.1
Birmingham, 421,258...	824	235	...	1	2	6	31	2	..	..	20.2
*Dublin, 351,014.....	819	130	136	6	13	56	17	11	..	18	29.8
Manchester, 338,296....	908	209	...	2	4	69	38	6	11	7	28.1
Leeds, 327,324.....	658	128	...	1	22	1	18	8	..	7	20.6
Sheffield, 300,563.....	635	146	...	..	3	47	25	8	3	5	21.8
Edinburgh, 246,703....	416	80	88	2	3	..	18	9	..	7	18.0
*Belfast, 216,622.....	614	128	108	2	6	169	16	10	..	9	39.4
Bradford, 209,564.....	389	91	...	2	1	3	21	4	..	4	18.9
Hull, 181,225.....	329	85	...	1	3	..	6	1	2	6	18.4
Newcastle, 151,325.....	523	118	...	1	10	82	8	4	..	6	32.2
†Havre, 105,867.....	169	29	23	8	..	3	4	2	..	8	34.1
Rheims, 93,823.....	241	51	36	6	1	..	3	11	1	30	26.0
Nancy, 74,954.....	195	39	17	1	..	13	7	5	..	7	26.5
Breslau, 290,000.....	915	317	92	16	..	1	11	2	..	75	32.1
Brussels, 171,293.....	319	57	49	15	3	4	3	4	..	47	21.8
Cologne, 150,513.....	450	105	56	3	3	16	8	1	..	23	30.4
*Christiana, 122,000....	145	36	18	29	13	..	1	2	..	8	19.4
FIVE WEEKS ENDING MAY 23, 1885.											
Frankfort, 145,100.....	315	65	29	7	4	1	..	1	..	14	22.0
Hanover, 131,200.....	311	75	28	11	6	29	2	2	..	2	24.2
Bremen, 119,561.....	236	63	26	2	2	..	1	..	..	3	20.2
Dantzic, 116,162.....	287	102	20	19	9	..	1	2	..	20	25.0
Stuttgart, 109,937.....	221	64	27	9	..	..	..	1	..	16	21.2
Strasbourg, 110,789....	301	93	52	10	2	..	1	2	..	38	27.7
Dusseldorf, 105,287....	257	96	26	4	..	..	7	2	..	14	24.2
Nuremburg, 105,176....	257	81	45	8	1	..	2	1	..	22	24.9
Chemnitz, 102,713.....	315	136	13	15	..	..	..	..	1	6	30.8
Magdeburg, 105,000....	252	81	24	7	1	1	1	2	..	6	24.0
Elberfeld, 101,000.....	216	56	15	4	2	..	3	1	..	9	22.0
Barmen, 100,000.....	222	59	21	15	4	..	2	3	..	6	22.6
Altona, 97,000.....	299	91	60	11	2	..	2	2	..	12	31.5
Aix-la-Chapelle, 89,116.	230	73	22	1	2	..	..	3	..	8	26.4
Mayence, 64,120.....	162	39	32	5	3	..	1	5	..	3	25.9
Amsterdam, 350,202....	789	...	...	19	..	13	11	..	..	..	22.5
Rotterdam, 166,001....	359	...	...	2	10	..	..	3	..	4	22.0
The Hague, 131,417....	307	...	...	..	..	..	5	2	..	3	23.7
*Lyons, 376,613.....	626	...	262	7	1	..	..	4	1	6	21.5
Berlin, 1,225,065.....	2,849	913	218	168	23	34	29	13	..	174	23.4
*Hamburg, 486,678....	1,027	287	166	45	10	7	4	17	..	43	26.7
Dresden, 236,000.....	570	140	65	27	9	..	2	4	..	16	24.5
Munich, 240,000.....	769	272	99	16	9	19	2	...	3	92	34.9
Leipzig, 164,636.....	377	155	23	16	4	7	3	1	..	35	23.2
Kœnigsburg, 154,000...	450	126	68	23	5	..	..	4	..	37	29.8
*Bucharest, 200,000...	486	137	98	1	16	10	5	6	..	26	30.8
Paris, 2,239,928.....	5,508	767	620	189	25	219	31	91	25	301	25.0
‡Calcutta.....	1,460	...	...	..	..	..	..	850	32	405§	35.1

* 4 weeks; † 2 weeks; ‡ 5 weeks ending April 18; § cholera.

LITERARY NOTICES.

POISONS: THEIR EFFECTS AND DETECTION. A MANUAL FOR THE USE OF ANALYTICAL CHEMISTS AND EXPERTS, WITH AN INTRODUCTORY ESSAY ON THE GROWTH OF MODERN TOXICOLOGY. By ALEXANDER WYNTER BLYTH, M.R., C.S., F.C.S., etc.; Public Analyst for the County of Devon, and Medical Officer of Health and Public Analyst for St. Marylebone. With Tables and Illustrations. Vol. i., 8vo, pp. 365. New York: Wm. Wood & Co.

This is the June number of "Wood's Library of Standard Medical Authors," and completes an entirely rewritten and greatly enlarged Second Edition of the author's "Practical Chemistry." The author and his writings are sufficiently well known to justify the selection of this work as one well adapted to the series in which it appears, as a standing authority on the subject of which it treats.

ARCHITECTURE SIMPLIFIED; OR, HOW TO BUILD HOUSES, is a little book on an important subject, illustrated with practical designs, and with estimates of cost, of practical value to all who intend to build. Price 25 cents. George W. Ogilvie, 236 Lake Street, Chicago, Ill.

HOW TO DRAIN A HOUSE—PRACTICAL INFORMATION FOR HOUSEHOLDERS, by GEORGE E. WARING, JR., M. Inst., C.E., Consulting Engineer for Sanitary Drainage, etc. 12mo, pp. 230, $1.25. New York: Henry Holt & Co.

This is a well gotten-up essay, in large type and on good paper, giving a clear statement of the progress made by practical men in the subject of which it treats. It describes the subsurface irrigation system of sewage disposal, which is excellent under some circumstances, and has a good chapter on water-closets, a main purpose of which appears to be to show the excellence of the "Dececo" closet of the author's own invention, which is one of the best made.

MINNESOTA FROM THE STANDPOINT OF PUBLIC HEALTH, is a pamphlet of sixteen pages, compiled by the Secretary of

the State Board of Health, as Superintendent of Minnesota Sanitary Exhibit at the Exposition in New Orleans, 1885, which forcibly sets forth the special advantage of that State in conditions promotive of health and physical development.

REPORT OF THE MANAGERS OF THE STATE LUNATIC ASYLUM, Utica, N. Y., for 1884.

"The report of the Superintendent shows that on October 1, 1883, there were 604 patients in the asylum; that is, 304 men and 300 women; that there were admitted from October 1, 1883, to October 1, 1884, 201 men and 186 women; total, 387.

"The whole number under treatment during the year was 991, 505 men and 486 women, and the daily average number under treatment was 613.

"There were discharged during the year 194 men and 190 women; in all 384, and there remained in the asylum, September 30, 1884, 311 men and 296 women; total, 607 patients. Of those discharged, 46 men and 43 women were discharged recovered; 22 men and 29 women improved; 78 men and 99 women unimproved; 9 men and 2 women were discharged as not insane, and 39 men and 17 women, 56 in all, died."

Of the probable exciting cause of insanity in the 387 admitted for the year, 71 are attributed to ill-health, over-work, grief, anxiety, and loss of sleep; 27 to general paresis; 16 to intemperance; to other causes, from 1 to 9. Of occupations: Housekeepers, 115; houseworkers, 51; farmers and farm laborers, 49; laborers, 42; workers in wood, 14; clerks and salesmen, 13; merchants, 10; other causes, 1 to 10; no occupation, 11. Of the proximate cause of death, out of the whole number of deaths, 15 only were from paresis; other cerebral diseases, 8.

REPORT OF THE MANAGERS OF THE BUFFALO STATE ASYLUM FOR THE INSANE, New York, 1884.

The Superintendent reports: Patients in the asylum, September 30, 1883, 329; admitted during the year, 275; total in the asylum, 604. Discharged: Recovered, 80; much improved, 13; improved, 25; unimproved, 88; died, 43; not insane, 8—257. Remaining, September 30th, 347. Of the assigned causes of insanity in the 275 admissions for the year: Ill-health from various causes, 111; epilepsy, 16; paresis, 13;

intemperance and syphilis, each, 11; various other causes 1 to 9. Of the 43 deaths, paresis is named as the proximate cause of 10 only; other cerebral diseases, 13.

REPORT OF THE SUPERINTENDENT OF THE STATE ASYLUM FOR INSANE CRIMINALS, Auburn, N. Y., 1884.

Inmates, October 1, 1883, 147; admitted during the year, 52—199. Discharged during the year, 45. Recovered, 17; improved, 4; unimproved, 20; not insane, 2; died, 2. Remaining, September 30, 1884, 154. Of the two deaths, one was from consumption, the other one suicide. The habits of life of those admitted during the year, and since the opening of the asylum, February 2, 1859, were: Temperate, 162; intemperate, 316; moderate, 183; unascertained, 57.

REPORT TO THE BOARD OF HEALTH OF THE STATE OF LOUISIANA ON THE SANITARY CONDITION OF JAMAICA, by LUCIEN F. SALOMON, M.D., with resolutions adopted at a meeting held Wednesday, April 1, 1885.—This is an instructive report on the results of practical sanitation in a place once exceptionally subject to the prevalence of yellow fever. Dr. Salomon visited the island with special reference to the "ten days' quarantine" imposed upon all vessels arriving at New Orleans from certain places during the summer months; the result of his visit has been the withdrawal of Jamaica from the list.

BACTERIAL PATHOLOGY.—A series of papers on the exhibit at the Biological Laboratory of the Health Exhibition, under the direction of Watson Cheyne, and published in *The Lancet*, have been republished in pamphlet, with illustrations. It is an admirable brief of the whole subject. Price 25 cents. The Industrial Publication Company, New York.

SANITARY REVIEW OF THE SESSION, by EDWIN CHADWICK, ESQ., C.B., is a pamphlet of a dozen pages. The presidential address at the monthly meeting of the Association of Public Sanitary Inspectors, London, March 2, 1885, which sketches the progress of life-saving by sanitation in military life in India, by the reduction of the death-rate from 67 to 20 per 1,000, and the practical means which have led to it.

THE SANITARIAN.

AUGUST, 1885.

NUMBER 189.

THE RELATION OF THE DEPTH OF WATER IN WELLS TO THE CAUSATION OF TYPHOID FEVER.*

By HENRY B. BAKER, M.D., Lansing, Mich.

DURING the last six months of the year 1881, and the first three months of 1882, sickness from typhoid fever was, I believe, much more than usually prevalent in the State of Michigan. The evidences of the truth of this statement are found in the Annual Reports of the Michigan State Board of Health; and they consist of replies by regular correspondents to questions asked by the board, and of tables compiled from weekly reports of sickness, made by health officers and other prominent physicians in different parts of the State. Of forty-three correspondents, eleven reported typhoid fever (and nine reported typho-malarial fever) usually prevalent in 1881, while only one reported typho-malarial fever, and not one reported typhoid fever as less than usually prevalent in that year.

Beginning with July, 1881, the sickness reported from typhoid fever was about fifty per cent. greater than the average for corresponding months in the five years 1878–1882, and it continued at this high rate until April, 1882.

* Abstract of paper read before the American Public Health Association, at St. Louis, Mo., October 16, 1884.

For this increased prevalence of typhoid fever, a variety of supposed causes were alleged by the physicians who reported, but, taken altogether, the alleged causes seem at first sight nearly to negative each other; the number alleging excessive rainfall, wet soil, etc., at some time during the year, about equalling the number who alleged unusual drought as the cause of the sickness. But by a careful study of the evidence relative to the condition of the soil and of the ground-water, immediately preceding and during the prevalence of sickness from typhoid fever, it is found that it was one of unusual drought and low water in wells in quite a number of different parts of the State, beginning with July, 1881, and that, although the rainfall later in the year was sufficient to make the surface-soil moist, the water in wells continued unusually low. It was especially low in July, August, and September, 1881. . . . In quite a number of localities, observers have made records which show either a coincidence between the low water and sickness from typhoid fever, or that the fever occurred in months succeeding the low water.

The *sickness* from typhoid fever in Michigan was unusually great in the last part of the year 1881 and first part of 1882, compared with other years, according to reports extending back to 1876. The *deaths* from typhoid fever were also unusually numerous in the year 1881, compared with other years. The mortality statistics extend back to the year 1866.

I have compared reports of the meteorological and other conditions in the years 1881–1882 with those for other years, and I find no condition, concerning which we have records, that varied in such manner as to explain the unusual prevalence of typhoid fever in those months, except the condition of the ground-water as indicated by the lowness of water in wells. The temperature of the atmosphere was unusually high during those months; but to high temperature of the atmosphere the causation of typhoid fever has never been directly traced; the disease occurs in cold as well as in hot climates, and in cold as well as in hot seasons of the year; and although in Michigan it follows the hot weather of summer, in some other countries it follows the cold season. On the other hand, the disease has many times (hundreds of times, I suppose) been traced directly to the use of contaminated drinking-water.

There is one other closely related physical condition that it would seem may have influence in the causation of typhoid fever, namely, the *temperature of water in wells*, and of the fluids in privies. The temperature of water in wells is recorded and reported each month from some localities in Michigan, and some study has been given that subject in the preparation of this paper; but the changes in the temperature are so slight that it is difficult to see how they can have *great* influence. Moreover, any effect this may have is so hidden in the greater changes in the quantities of water in wells, usually coincident with, if not one cause of, the changes of temperature therein, that it is difficult to distinguish separate influences, if such there are.

From the foregoing it appears that in Michigan there is a relation between low water in wells and the prevalence of typhoid fever; that this relation is found to hold by seasons of the year—those months in which the water is lowest (or the months immediately following) being the months in which typhoid fever is most prevalent; and the unusual year 1881–2, when typhoid fever was more prevalent than ever known before, was also unusual because of the exceeding low water in wells.

A relation of low water in wells to the prevalence of typhoid fever being considered established, several questions arise:

1. Is there a quantitative relation? That is to say: Is the amount of sickness from typhoid fever proportional to the amount of water in wells?
2. Does the drinking-water cause the typhoid fever?
3. What constituent of the drinking-water causes the typhoid fever?
4. How can typhoid fever be prevented?
5. What need is there for the prevention of typhoid fever in Michigan?

IS SICKNESS FROM TYPHOID FEVER INVERSELY PROPORTIONAL TO QUANTITY OF WATER IN WELLS?

At first glance it may seem to be impracticable to measure and compare quantitatively such dissimilar things as water in wells and sickness from typhoid fever. Yet whenever we can

get the statements of the facts such comparisons are now not difficult. We have only to construct diagrams on the proper principle, and accurately drawn according to definite scales. It may be well to say here, that the way to do this is to so plan the diagrams and the scales by which the two or more things to be compared are to be shown that the *extremes* of the two or more things to be compared (the highest and lowest statements in the diagram) shall be the same distance apart—in which case the greatest range of the statements for each will appear to be the same. In a diagram prepared in accordance with this principle, if there is a fixed and definite quantitative relation between the things compared, it will be apparent; because the greatest ranges of the several things compared being *made* to coincide, the minor fluctuations will also coincide in the amount of space they occupy on the diagram. This will be true as regards the *amount* of the fluctuation, even though the fluctuations may not exactly coincide in point of *time*—even though one of them, for instance, be constantly in advance of the other in time.

This principle, just stated, has been held in mind in the preparation of the diagrams which show the relation of the depth of the earth above the ground-water in wells in Michigan, and the prevalence of sickness from typhoid fever in Michigan, by months, in each of the years 1878, 1879, 1880, 1881, 1882, and 1883; also an average for five years—1878–82.

The statements of the sickness from typhoid fever relate to the State of Michigan as a whole—being summarized from weekly reports of physicians in many parts of the State. The wells measured are not the same in number in both years, and they are not the same wells in both years; so that no comparison can be made of one year with the other as to the exact height of the water during the year as a whole, or of one month with the corresponding month in another year. The comparisons intended to be shown (by several diagrams submitted at the time the paper was read) are of one month with the others in the *same* year. The number of wells was very few; but an examination of the subject seems to show that it is sufficient to fairly indicate for each year the rise and fall of the ground-water throughout the State.

Beginning with June in each year, the sickness from typhoid fever follows more or less closely the curve representing the average depth of earth above the ground-water. If the sickness is caused by the low water, there is a good reason why the curve of the sickness should *follow* the curve representing the lowering of the water; because the statement of the sickness is: What per cent. of weekly reports received stated that typhoid fever was under observation during the week for which the report was made; and as the disease lasts for about three weeks, and as cases taken sick in preceding weeks will remain under observation until death or convalescence, and be reported together with those just taken sick, the curve for sickness would, when rising or falling, necessarily lag behind the curve representing the cause of the disease by about the average duration of the disease. As there is in this disease an incubation period of varying length, which may be ten days, two weeks, or even more, this would still farther postpone the sickness, compared with a curve representing its cause. Usually a few days' sickness pass before the doctor is called, and the disease recognized and reported as typhoid fever. So that if low water causes the sickness, we would expect, as a rule, to find the changes in the amount of sickness to appear to lag behind the changes in the level of the water by about one month. This is very nearly what we do find relative to the average for the five years, and with respect to each of the years 1878, 1880, 1881, and 1883; namely, that the rise or fall of the disease appears to be greatly influenced in any month, after May or June, by the level of the water in that same month, but that the influence extends over into the succeeding month.

The comparison between the depth of water in wells and the sickness from typhoid fever being so close for every month after June, what is the reason for the want of correspondence in several years from January to June? For the year 1881 the earth above the water increased from January to March, and decreased from March until June, while the sickness seemed to decrease because of the low water in wells in March, and to increase in consequence of the rise of water in April. In considering this subject, it seemed to me that the cause of the low water in March, 1881, might be the great depth to which

the ground was frozen; and that the reason why the sickness was decreased might be that the privies and other sources of typhoid contamination were also frozen, and the liquid therefrom prevented from descending to the water in the wells. The water in the wells would then be derived in greater proportion by percolation from a distance, in some cases from streams not frozen. In either case, whether the water in wells came from the distant streams above ground, or from the general level of the ground-water, the ground above being frozen deeply, the water which enters the wells would be filtered much more slowly through the deep strata of the earth than is the case when rain passes freely down to wells through foul surface-soil. To learn whether this supposed explanation accorded with the facts, I have turned to the reports by the meteorological observers for the State Board of Health of Michigan. . . .

From the evidence, not only in the spring of 1880, but in the early part of other years, typhoid fever was prevalent coincidently with an unfrozen surface of the ground. The year 1882 is another example of high ground-water and high rate of *sickness* during the first few months of the year. By reference to the reports of meteorological observers for the Michigan State Board of Health, it is found that February and March, 1882, were unusually mild months.

We thus reach the conclusion that, in Michigan at least, the relation of the depth of water in wells to typhoid fever is not the same in summer as in winter; that in summer, when vegetation is active and not decaying, a lowering of the water is uniformly followed by increased prevalence of typhoid fever; with the advent of colder weather there is a rise in the water-level, which is uniformly followed by a decreased prevalence of the fever; that this decrease continues through the winter and spring, even though the level of the well-water is lowered, *provided* the surface of the earth is deeply frozen; that on the contrary, *high* water-level in wells in winter and spring, coincident with ground *not* thoroughly frozen, is followed by *increased* prevalence of the fever. Briefly stated, the typhoid fever follows *low* water in summer, and *high* water at that season of the year when the ground is usually thoroughly frozen.

WHAT CONSTITUENT OF THE DRINKING-WATER CAUSES THE TYPHOID FEVER?

Typhoid has been known to occur after the drinking of water contaminated by decomposing vegetable matter (turnips, in one instance *); by decomposing *animal* matter (a turtle, in one instance †); also in the autumn succeeding a hot summer, in which diarrhœa had been unusually prevalent; and the unusual fouling of the water-supply by the extra quantity of fecal discharges under these circumstances has been supposed to have causative relation to the typhoid fever which succeeded it. All this receives explanation if we accept the doctrine that typhoid fever is caused by bacteria, because bacteria require for their growth and multiplication a nutritive solution—either mineral (such as Pasteur's), or vegetable, or animal; very few, if any, of the many species of bacteria being able to reproduce themselves in great numbers in *pure* water. This last statement seems to me to be evident to those who have used the microscope much; yet I may quote from a high authority as follows: Dr. Robert Koch, in his recent address on cholera, before the Imperial German Board of Health, is reported to have said: "I would not certainly assume that the multiplication of the comma-bacillus outside of the human body takes place in well-water or in river-water without any assistance, for these fluids do not possess that concentration of nutritious substances which is necessary for the growth of the bacilli." ‡ Dr. Koch was, however, able to reproduce the comma-bacillus in meat-juice, and in other nutritive solutions. After mentioning the growth of bacteria in stagnant water, and that "the continuous flow of water prevents the formation of a local concentration of nutritive substances in the liquid sufficient for pathogenic bacteria," Dr. Koch further says: § "The connection between the falling of the subsoil-water and the increase of several infectious diseases, I would explain as follows: that when the subsoil-water falls, the current that takes place in the subsoil-water is much less significant. Besides, the quantities

* Sanitary Record, London, January 29, 1876, vol. iv., pp. 81–82.

† Annual Report Michigan State Board of Health, 1876, pp. lxii.–lxiv.

‡ British Medical Journal, September 6, 1884, p. 456.

§ British Medical Journal, September 6, 1884, p. 456.

on the surface are much diminished, so that those concentrations which I assume to be necessary for the growth of the bacteria must much sooner take place." I venture to suggest that the evidence we now have of the causation of typhoid fever renders it necessary that we substitute for Dr. Koch's diminished quantities of fluids "on the surface," *diminished quantities of water in wells* as more *directly* causative of typhoid fever; because that disease is *not* frequently traced to transmission through the air, but *is* frequently traced to the use of bad water; so that, aside from such evidence as that which I present to you at this time, we have good reason to believe that in some way typhoid fever is frequently caused by the drinking of contaminated water. The cases recorded are exceedingly numerous.

HOW CAN TYPHOID FEVER BE PREVENTED?

If the evidence which I have presented is conclusive, the reply to the above question may be stated in four words, namely: *Stop drinking contaminated water.* This might not prevent *all* the typhoid fever; but it would appear that by far the greater proportion of it in Michigan may reasonably be expected to be thus preventable. How to prevent the contamination of the various water-supplies cannot be briefly stated; but if people care enough about it to take the necessary trouble to do this, sanitarians can tell them how. So far as it relates to typhoid fever, it *may* be that all that is necessary is to destroy and keep out of the water all discharges from persons suffering from typhoid fever; but the difficulty of recognizing the disease early enough in its course is so great, that in order to do this it will be necessary to keep all human excreta, and perhaps the excreta of some animals, out of the water-supply. Most people think they do this now, or probably we would not have a thousand deaths a year in one State from this cause; but I think we have reason to believe that their confidence in the purity of the water they drink is misplaced, and that consequently many of them sicken and die. The numerous instances where typhoid fever has apparently been caused by drinking-water contaminated by decomposing *vegetable* matter indicate that, even if the cause of the disease is

specific, until such time as that the specific cause shall be so restricted as not to find access to water-supplies, it is important to preserve the water from contamination by vegetable as well as by animal matter.

COLORED CORONA.—Cornu notices several interesting particulars in the late phenomena of colored illuminations surrounding the sun. The reddish corona, concentric with the sun, observed by Thollon and Forel, is the simplest manifestation; it appears in perfect form only when the sun is at a great height above the horizon, in the midst of a sufficiently clear sky. When the sun declines, the lower arc of the corona enlarges and becomes more intense; underneath from the horizon springs a colored band of the same tint, which extends toward the corona as if attracted by it, and finally surrounds it. During this change the brilliant interior space, of a slightly bluish whiteness, remains sensibly circular, but by an optical illusion the sun seems to be drawn toward the lower border. Toward sunset the tints gradually change, first to a Naples-yellow, then to a brownish yellow. After sunset the corona puts on the appearance of a light smoke, which gradually fades away, the colors blending with those of the setting sun. Mist or light cirrus generally effaces all these phenomena; but thick cumulus, with openings of blue sky, is sometimes attended with a bright copper-red, shading through various intermediate tints into the azure of the sky. The corona introduces a great perturbation in the polarization of the sky, varying the distances of Arago's, Babinet's, and Brewster's neutral points from the solar or anti-solar centres, and is attended by four new neutral points placed in pairs nearly at the height of the solar and anti-solar centres.—*Comptes Rendus*, September 22, 1884.

THE FUTURE WATER-SUPPLY OF PHILADELPHIA.*

By COLONEL WILLIAM LUDLOW, Chief Engineer of the Philadelphia Water Department.

VICE-PRESIDENT FREDERICK GRAFF introduced Colonel Ludlow, who spoke as follows:

MR. PRESIDENT, LADIES, AND GENTLEMEN: I must admit that I was somewhat taken by surprise when I received the invitation from the very excellent Secretary of the Institute, requesting me to attend the meeting to-night and make some remarks regarding the future supply of the city; I was under the impression that the meeting would resolve itself into an informal, professional discussion of the matter, but I find that I am to have the field somewhat to myself, and to talk to more people than I had anticipated. I know, however, that you are all interested in the subject as well as I, but I have not prepared any formal address, and shall confine myself, therefore, to general remarks as to the present aspect of the important question of the future water-supply of this city.

The subject is not new. I think my friend, the President, will admit that it was an old one in his early days, and it has so continued to the present. Agitation of the subject has continued for a generation past without definite conclusions being reached, although we are approaching more and more closely to the necessity for reaching a decision. The futility of discussion has resulted mainly from the absence of full and accurate investigation of the real facts, upon which alone a reliable and final judgment can be made. The situation is about this: Philadelphia is a city happily situated in many respects, with a great river on either side; one stream, the Schuylkill, drains a mountain region, and has been looked to both to supply the

* Abstract of remarks presented at the Stated Meeting of the Franklin Institute, held Wednesday, April 15, 1885.

water needed for municipal purposes, and even to furnish the power by which that supply should be pumped and delivered to the citizens. Hence the construction of those early water-works at Fairmount, originally breast-wheels, which were later converted into turbines, and which have continued in service to the present day. With the growth of the city came the necessity for an increase of quantity, and from time to time the appliances for augmenting the daily pumpage have been multiplied, until now there are no fewer than eleven engines at four great pumping-stations drawing from the Schuylkill River, into which, to a considerable extent, the waste matters of the valley are poured. On the other side of the city is a great tidal stream which receives the waste matters of the community, and at two points upon the Delaware we have been drawing these waters to supply the districts of Kensington and Frankford, but it has long been recognized that the water pumped at Kensington contained matters prejudicial to health, and the quantity of this was increasing year by year; this station has therefore been abandoned. The serious thoughts of those who from time to time have been charged with or interested in this vital matter of water-supply have been turned to the consideration of the means of amending the defects of quality and quantity. There are two sources whence the city of Philadelphia can take its water—I mean practical sources, as determined by engineering considerations; namely, the valley of the Schuylkill and the valley of the Delaware. The problem to be solved is whence a suitable supply both in quality and quantity can be derived to the best advantage; namely, at the lowest cost of construction and the lowest future cost of maintenance. A gravity-supply is advantageous when practicable, for the reason that the water intercepted at a sufficient elevation will pass from its source to the city through the conduits, as water will flow down hill, whereas the raising of the large quantity of water required for the supply of the city involves heavy expenditure for machinery, and a constant annual charge for fuel and service.

For two years past the department with which I have the honor to be connected has assiduously sought to gather all the information bearing upon this matter which was attainable by topographical and hydrographical surveys, by meteorological

observations, by chemical analyses, and by sanitary inspections, endeavoring to cover the entire field within which lay facts pertinent and important. Our observations are drawing to a close. About nine-tenths of the field of exploration have been covered, and I trust that within another year we shall be enabled to complete and digest the information so gathered, and present to the city, and to the engineering world, the results of our labor in complete shape. It was for lack of this information that previous investigations have been rendered futile. The most important report which has been made upon this subject was presented about ten years ago, in 1875, when, in anticipation of the celebration of the Centennial, a commission of eminent engineers was gathered to consider the entire subject, taking into account both the condition of the present supply and what should be done for the future. That their report, containing most valuable information, should have resulted in inaction is largely attributable to the fact that they were without the necessary exact data for final judgment. They made the best recommendations which, under the circumstances, could have been formulated, but in the light of fuller information it is necessary to differ in some respects from the preliminary conclusion which they reached.

At present I cannot say that I am prepared to announce final conclusions as to the general solution, but it appears to lie in the choice of two projects.

Many years ago Mr. Birkinbine, who was then the Chief Engineer of the Water Department, proposed to secure a suitable gravity-supply by impounding the waters of the Perkiomen Creek, the most important affluent of the Schuylkill River, which from the supposed ample flow and purity of its drainage promised to be satisfactory and sufficient. The project contemplated the construction of a high dam near Schwencksville, where the valley was narrowed and the rocky banks afforded a suitable site for a construction of this kind, and the Commission of 1875 were inclined, upon the data at their disposal, to favor this project, especially as the estimates of cost of a supply from the Delaware were vastly greater. Were we sure of ample amount and good quality, the Perkiomen project would present undoubted advantages of a high order. Unfortunately our investigations tend to show that the flow of the stream,

even aided by gathering the waters of some of its affluents, is insufficient for the total quantity that Philadelphia will require in the near future. The Delaware project had never been carefully investigated, and for this reason, in 1883, two parties were formed, one to run a conduit-line to the Perkiomen, and elaborate the necessary information; the second party to run a corresponding line northward to the Delaware, with the view of extending the investigation to near the Water Gap, at some elevation which should be found sufficient to permit the river to flow into the conduit and thence into the city; and the apparent probability of the insufficiency of the Perkiomen gave greater weight to the Delaware project than it had hitherto borne.

In considering the route toward the Gap, an examination of the map showed that an elevated region, designated as the South Mountain, stretching from northeast to southwest, lay across the peninsula between the two rivers, and would bar the construction of an aqueduct without extensive tunnelling. A line northward from the city to the Delaware River reaches that stream at a point just below the gorge of the South Mountain, and a practicable conduit-line upward could thence be made by following the valley of the stream, and thus evade the formidable obstruction which the mountain presents. Pursuing this plan, the surveyors were pleased to find, in the first place, an unexpectedly favorable line to the Delaware at Point Pleasant, half-way between Trenton and Easton, and the analysis of the water of the Delaware at this point further proved that in quality it was little inferior to the noted waters of the Gap itself.

This was our discovery. Furthermore, in proceeding northward from Philadelphia the conduit-line crosses the valleys of several creeks of considerable volume—the Perkiomen, the two Neshaminies, and the Tohickon; the latter stream discharging into the Delaware at Point Pleasant. The thought at once suggested itself, that by utilizing the flow of these streams they could be intercepted, turned into the conduit, and sent to the city by gravity, and that for a greater portion of the year the flow of these would be sufficient to supply all requirements, and that for such times as this flow should be deficient it could be made up by pumping from the Delaware itself. This, prac-

tically, constitutes a new project, as compared with that of drawing water from the Gap entirely by gravity, and the expense of this construction was moderate enough to bear comparison with the Perkiomen project. It was found, for example, that the distance, in each case, was about the same, namely, thirty miles; and that the cost of construction was also about the same, namely, from $6,500,000 to $7,000,000. This estimate, you will understand, is that of the cost of the construction of the conduit merely, without adding other items (which will no doubt be large) for dams, land-damages, and other contingent expenses.

These conduits, I might say, are designed to be twelve feet in diameter with a grade of one foot in six thousand, and with a capacity of delivering to the city 210,000,000 gallons a day, at an elevation of 166 feet above city datum. This elevation is that of the existing Wentz Farm Reservoir, on the county-line northwest from Bridesburg, and of the proposed Cambria Reservoir in the upper portion of the Twenty-eighth Ward.

With regard to this question of quantity, the following considerations present themselves: Our present pumpage is about 70,000,000 gallons a day, with a population approximating closely to a million people. A generation hence Philadelphia will contain two millions of inhabitants. The supply must therefore be doubled, which would make it about 150,000,000 gallons a day. Furthermore, allowance must be made for the fact, that in a large community like ours the use of water for the multiplied purposes of manufacturing and domestic uses increases in a greater ratio than the population itself. With works of the magnitude and cost of these which we have been discussing, it would be folly to project for a smaller supply than will be required within a generation, and for this reason 200,000,000 or 210,000,000 gallons were estimated for, and the dimensions and grade of the conduit were thence determined.

Going back now to the question of distance and cost, it will be seen that exact observation proves that for the first time the two projects, the Perkiomen and the Delaware, began to balance each other, and should the Perkiomen prove insufficient, the Delaware project would practically stand alone; but in order that all possible ground should be explored, I directed the examination of the upper Lehigh, a stream with which I

was personally familiar from frequent journeys over the mountains to the Susquehanna Valley, and which, although so distant, possessed favorable characteristics from the purity of its water and the great elevation of its water-shed. When, therefore, the Perkiomen proved of doubtful adequacy, the acute suggestion was made by Mr. Hering, who in a most thorough and capable manner has had immediate charge of these surveys, that were a sufficient amount of the waters of the upper Lehigh brought into the upper valley of the Perkiomen, a most excellent supply could thereby be secured.

You will observe that in all this matter the question of quantity has been of vital importance. We want 210,000,000 gallons a day. Now, the low-water flow of the Delaware at the Water Gap in 1883, at a time when the stream was lower than it had been within the memory of the oldest inhabitant, was gauged, and its flow at that time found to be about 700,000,000 gallons of most excellent quality. At Point Pleasant the volume of the river is about one-third greater than this, and in quality nearly as good as at the Gap. The Lehigh has a moderate flow. Its minimum in 1883 being about 70,000,000 gallons, but with excellent facilities for storing water at a great elevation above the reach of pollution. The bringing of this down into the upper valley of the Perkiomen would double its supply, and the combination would once more have the prestige of a practicable and promising project.

At present, therefore, these two projects lie before us for consideration and ultimate decision, and, as I said before, within another year I trust that the problem will have been solved.

It may be of interest to explain how it happens that, with the Schuylkill flowing past our doors, all the engineers who have studied this subject seem to have concluded that at some time or other the Schuylkill River itself must be abandoned as a source of water-supply. The reasons are these: The origin of the Schuylkill is in the mountains among the coal-mines. The drainage from the coal-measures, supplemented by the large amount of pumping from these mines, constitute a volume of acid water which fills the upper portions of the stream, and is unfit either for drinking or manufacturing purposes, or even to sustain life. No fish can exist in it, nor can human

beings drink it. In the course of its flow downward, the Schuylkill above Reading traverses a geological belt of limestone, whence considerable affluents feed the river, bringing with them a solution of the lime, and the alkaline waters mingling with the acid waters of the parent stream neutralize each other, and become again fit for ordinary purposes and for the existence of fish. Thereafter we have no further difficulty in this respect; that is, with regard to the chemical characteristics of the water. The water as it reaches Fairmount Dam is sometimes slightly acid, sometimes slightly alkaline, and sometimes neutral. But the important fact remains to be noted, that the valley through its length is a populated district from end to end, and into it are poured all the waste matters of a large and busy population; every town and industry contributing its quota of pollution, whether sewage or the waste products of manufacturing establishments. With two great railroads extending up its banks, and with communities and towns increasing year by year in number and population, the Schuylkill can be described only as an industrial valley, which in the future will be densely populated; and it becomes manifest at once that unless extensive engineering constructions be planned, strict legislative enactments be passed, and rigid enforcement of these laws be insured, the waters of the Schuylkill must continue to receive deleterious matters in constantly increasing quantities, and that ultimately they will cease to be available for the purposes of that great city which lies at its mouth and absorbs the contaminations of everything above.

The population of the valley above Philadelphia, at present, is in excess of 350,000, and if we are to endeavor to protect the stream from this pollution, which is not only nauseous in contemplation, but in fact dangerous to health, sewers must be built upon both banks, which shall intercept and discharge all waste matters and convey them down the entire length of the valley until they can be discharged into the Delaware River below the city.

Another important fact must be observed; within sixty years a marked diminution has taken place in the minimum flow of the stream.

Sixty years ago the summer flow of the Schuylkill was estimated at 500,000,000 gallons a day. Successive estimations

of the low-water flow were made from time to time, all showing a diminution in quantity, until that in 1874 determined the minimum flow as 250,000,000.

Here, then, within this period, the low-water flow of the stream has decreased one-half, and, supposing that it had gone no farther than was observed at the last examination, the flow of the stream when at its low stage is little more than the city will require a generation hence. It follows that, with but a slight shrinkage comparatively, in the future the city would be pumping up the entire river. I do not wish to be misunderstood with regard to this, and therefore beg to explain what I mean by the minimum flow: It is not probable that the total annual flow of the Schuylkill has decreased. This flow is dependent upon the rainfall, and cannot in the absence of any marked changes in the rainfall be itself materially modified, but the destruction of the forests in its head-waters, the clearing and cultivation of lands, have to a great extent deprived the river of that power of conservation which belongs to woodland, whereby the rainfall is held back and checked, as it were, in its passage to the stream, and the flow is more nearly equalized and prevented from dashing down and passing out. With the removal of the forests this fact ensues: The rainfall rapidly descends to the stream, creating a freshet which sweeps down the valley and passes out and is lost. During periods of drought, the rains being suspended, the river shrinks, its flow becomes moderate and its movement gentle, and presently we attain the minimum discharge.

In depending upon a stream, without taking means to restrain the passage of freshets, it is manifest that we can pump no more from the river than it will daily bring to us; and the minimum flow, therefore, should be as carefully investigated as we would investigate the strength of the weakest link in a chain from which we intend to support a weight.

It would be possible, by means of dams across the stream, to impound some portion of the volume of these successive freshets until the periods of drought, which occur always in summer and frequently in winter, and to draw upon these reservoirs when required. But again that question of the pollution of the stream comes in, occasioning doubt as to whether, should this be done, it might not be found in the end that large ex-

penditures had been wasted by reason of the inferior quality of the water and the injudiciousness of depending in perpetuity upon it. For the reasons given, the water varies greatly from time to time in its chemical character, potability, and wholesomeness. At times, during the passage, for example, of the freshets, the waters of the stream, being largely the results of recent rainfall, are in good condition; at other times they are highly charged with pollution, and occasionally get themselves into a condition of the most nauseous offensiveness. It is manifest that, unless these difficulties can be amended, the Schuylkill cannot continue to be regarded as a suitable supply for a population like this, and the vital importance to modern communities of a bountiful supply of wholesome water for all purposes is so great as to constitute one of the most serious problems relating to municipal existence, and sooner or later there is not a city in the world that has not this important matter to decide.

I have endeavored to present to you briefly the aspects of the problem precisely as they present themselves to-day. It is one in which every individual is in the highest degree interested. It is one upon which the future prosperity and welfare of this city depend.

I am very much obliged to you for your attention, and trust that some one will take up the discussion at this point.

DISCUSSION.

Professor Houston.—The exceedingly interesting remarks the gentleman has just made are enough to give thoughtful people considerable matter for reflection. The question of the water-supply of any great city must always be a difficult one to solve, since, as the needs for an increased amount of water grow, the ability of the ordinary means to give a large supply of pure water decrease. The rivers of any country are the natural sewers, into which the dirt and filth of that country drain; and to safely take the water-suppy of a large city from any river requires considerable thought and skill.

The problem as to the water-supply of the city of Philadelphia is one to which we have all given considerable attention. A number of years ago, I called the attention of the Franklin Institute to what I regarded as a dangerous pollution of the

Schuylkill River; and I am glad to hear Colonel Ludlow speak in such plain and unmistakable language concerning the probabilities of the near future of the Schuylkill. I take it that the real danger coming from drinking Schuylkill water does not exist with equal gravity all the year. During a large part of the year the lower basin of the Schuylkill, from which most of our city's supply is taken, is practically in the condition of a "steppe-lake," that is, a river without an outlet.

Under these conditions, its impurity increases from the loss of pure water by evaporation. For many months in the year, the citizens of Philadelphia know that comparatively little or no water goes over the dam; and were it not for the water which goes through the locks, there would be no discharge at all, except that which is pumped into our reservoirs. Under these conditions, we are actually damming up the river and drinking its contents. During many months in the year, and particularly those months when we should be the most careful of the purity of our drinking-water, we are drinking something that is far from wholesome. I have not the slightest hesitation in expressing this as my opinion. During this time of the year, from a water itself impure, we pass off a large quantity of pure water by evaporation, and drink the dregs. Now, we do not want the dregs of the Schuylkill, especially when in the immediate neighborhood of our pumping-stations we have the outlets of sewers.

Of course, Schuylkill water cannot be as poisonous as many allege, else we would not be here. The main point, in my mind, is: Can we rely on the Schuylkill for our water-supply in the near future, say for the next fifteen or twenty years? Colonel Ludlow has stated the problem very clearly. The very condition of the valley of the Schuylkill seems to render it improbable that we can continue using the water for drinking purposes.

The destruction of the forests over the upper basin of the Schuylkill unquestionably favors the rapid drainage of the rain-water; so that, for a considerable part of the year, we have so limited a supply that, as has already been shown, we endeavor to drink the entire river. Unfortunately, too, during that time in the year when the rain-water would make the river comparatively wholesome, by diluting it with pure water,

the rapid drainage brings down the filth and sewage accumulations from the river-banks. So the very time we ought to get comparatively pure water, we get it very impure. You are probably aware of the fact, that when the water looks the dirtiest it is not necessarily at its worst. In this condition it is often less harmful than when quite clear.

I therefore thoroughly agree with Col. Ludlow that the Schuylkill cannot be relied on for our future water-supply; nor, to my mind, can any simply impounded basin be relied on for the water-supply of Philadelphia. We have in any impounded basin the very conditions going on to which I have alluded in speaking of the lower Schuylkill. If you dam up a stream, and let even pure water run into it, there will be discharged into the air, as vapor, pure water, and comparatively impure water will be left in the reservoir. I believe it has been the experience of almost all our large cities that have tried the impounding plan, that it does not give satisfaction; not only from the disagreeable cucumber-odor given to the water, but from other reasons.

The Schuylkill must undoubtedly, for many years to come, be looked upon as the source of our city's water-supply; but, looking beyond this time, can we safely, for the next three or four generations, derive our water from this river? Were this river all we could get, of course we must go to it. That settles the question. I do not, however, believe so. It has sometimes seemed to me not such a very wild or visionary scheme to go to some magnificent natural subsidence-reservoir, like any of our great lakes. I know the distance is very great, but so is the population along the Atlantic seaboard. If some plan could be devised by which our large cities could share the expense, then it does not seem to me so impracticable to look to the great lakes for our water-supply.

We have other waters than the Schuylkill, however, close at hand. It is indeed a very fortunate circumstance, if, as Colonel Ludlow has remarked, the upper sources of the Delaware will probably, from their character, never for a long time to come be improved or cultivated. If no mineral deposits that would lead to extensive mining operations be discovered in the upper basin of the Delaware, then we may perhaps rely on the Delaware for our future water-supply. But even here does not the

same old question still suggest itself? Will not, in the remote future, the valley of the Delaware become densely populated, and thus pollute this stream?

There is one thing which, to my mind, seems somewhat of a danger, and that is the discharge of the intercepting sewer into the Schuylkill immediately below the dam. There is scarcely opportunity for the suspended solids to do anything but settle immediately in the bed of the river. I am aware that the discharge of the sewer at this point is but a temporary expedient; but I fear we are going to permit a temporary expedient to bring a great deal of trouble on Philadelphia, a trouble that may cost much to remove.

Already some of the best sections of our city discharge their sewage into the river below the height of mean tide. On the rising of the tides the water backs up the sewer, and causes a dangerous leakage of sewer-gas into the houses; added to this, the prevalent southwest wind brings very unpleasant odors as it is from the lower Schuylkill; so that, if we add to these sources of danger that arising from the formation of sewage deposits in the Schuylkill at this point, the danger may become very grave. It does seem to me that this is something that we ought to be very careful about—spend a little more money, if necessary, and carry the discharge a little farther below the mouth of the dam.

We have only to look at the forebay of the Fairmount Water Works to see the possibility of sediment collecting to the depth of several feet right alongside of the inlets to the water-wheels. Here, despite the velocity caused by a fall of many feet to the wheels, some six or eight feet of sediment had collected. I think there is a very great danger from similar deposits of sewage from the intercepting sewer, and one that ought to be attended to.

Mr. Graff.—I hoped to have this matter thoroughly discussed among the audience present to-night. Many of them have studied it to some extent, and have come to it with new light. We may sometimes look so long at an object (which is really true of painters and artists) that we lose its true proportions, and have to leave it and come back to it again before we are able to see its full merit. I may probably be in that position; therefore, I feel that there may be parties here who

might look on and discuss this matter with new light. I think there may be one thing said, and that is the point to which Colonel Ludlow has referred: the fact that, until the period when he was enabled by action of Councils to take up the matter, there had never been suitable surveys made such as would enable the citizens of Philadelphia, or the engineers employed, to come to any positive conclusion in regard to the proper future supply of the city of Philadelphia. I am glad to say that these surveys have now been carried on for some length of time; not only have been carried on, but with the utmost care, and with all the light and science that can be brought to the subject. Probably many of you realize how much there is to be considered. The developments of the day have taught us all very much more than we knew in former years; and the questions that attach themselves to this subject are so numerous and varied that it would be tiring you to go into them to-night. There are not only the surveys of the country; there are other objects besides that. We are only learning now how much of the rainfall can be utilized from a given area of country, and how pure it will come to us when we get it. The matter is made variable by the condition of the country, particularly the wooded condition, the effect of cutting off the timber of the forests, and all such matters. Colonel Ludlow has shown you by demonstration that the Schuylkill River is now suffering from reduced volume produced by that cause. Therefore, it behooves us all, and particularly those interested in the subject, to study thoroughly what may be the effect upon the Delaware and other streams suggested. Continued studies of these points have to be made when considering such a subject as this. They are now being considered. The geology and the surveys of the country examined have been so thoroughly gone over by Colonel Ludlow, that they are resorted to, and, as far as they go, will be used for the geological surveys of the State; this is to show how thoroughly the surveys are being made. I agree with Colonel Ludlow, that at this stage of the matter it would not be proper for any engineer to say positively what shall be the supply of the city in the future.

It is only feeling our way just yet. That way has been felt very far, and probably very soon an opinion, perhaps a very accurate one, can be formed. I shall be willing to leave the

matter in the hands of the Chief Engineer until these surveys have been completed and the whole subject thoroughly studied up. The balances that he tells you about, of all the different plans investigated, can then be made very important, but can hardly be gotten at until the surveys are completed. In the meanwhile, do what we may, we have to resort to the Schuylkill for our supply, because any comprehensive plan of supply is a work which will occupy much time. Even if we were to-day prepared to say that the Delaware is the proper source of future supply, and the building of an aqueduct were determined upon to-morrow, the difficulty of getting from the State appropriations necessary to carry on such a work is so great that a number of years would elapse before it could be brought into use. Therefore, in the interim, we are obliged to do the very best that we can with the supply we get now. Professor Houston has said, very properly indeed, that the Schuylkill has the disadvantage of being bottled up in Fairmount pool in the summer months, when the water is low and the outlets are only through the wheels at Fairmount and the locks, because at that time the pumping there has to stop and steam-power take its place. Therefore, the ability of the stream to purge itself from impurities is reduced just at the time when you want it to be the most pure. Another point comes in with that consideration, and that is, to-day we cannot store sufficient water in our reservoirs to give it the possibility of subsiding in any way. I think I am right in saying that the maximum storage in summer in the reservoirs is scarcely two days of the whole supply. Therefore, any discontinuance of pumping, you will necessarily see, must reduce the reservoirs to so low a point as to make it very unsafe. The reservoirs are so small that the water may be said to simply go through them—in one side and out the other. No time can possibly be allowed for subsidence while the storage capacity is so limited. As we have to continue using the Schuylkill, the palliation, not an entire remedy, is the erection of larger reservoirs, a relief which I hope soon will have some attention. The subject of making an appropriation is now before the Legislature, and possibly something will be done with it. The subject of the purity of the water in the Schuylkill (the impurity, I should say) is one there can be no doubt about. At times it is measurably pure,

at others it is not so. There is no use of disguising the fact. As I said before, a little palliation might be made by ability to store water. The subject of any relief of the Schuylkill, I think, has been pretty well gone over by the Chief Engineer. It is a very serious point; when you come in any way to disturb the industries upon the Schuylkill Valley, of course there will be more or less difficulties; such difficulties the Colonel has encountered, and has to a certain extent met. Protection may be insured by the sewer now building to carry the impurities below the point of supply. After all, the matter comes down to obtaining the light necessary to form an early decision as to what shall be the future supply. I think the surveys now making will give us this light, and, with the head we have conducting them, we are likely soon to come to a conclusion on that important point.—*Journal of the Franklin Institute.*

THE PUBLIC BATHS IN VIENNA.—The public baths of Vienna are said to be the finest in the world. The building is situated in the heart of the city, and encloses a basin 156 feet in width by 578 feet in length, and varying in depth to 12 feet. The enormous quantity of water contained in this basin is renewed three times a day. The whole establishment has accommodation for fifteen hundred persons, and is open from May 1st to October 31st, and from five in the morning until dusk. There is also a bath restricted to ladies, open from nine in the morning until one p.m.; and the Vienna ladies are especially good swimmers.

POPULATION OF PARIS.—The Prefect of the Seine has just published the returns of the last census, from which it appears that Paris then had 2,239,928 inhabitants; of whom 1,113,326 were males, and 1,126,602 females. When the previous census was taken, in 1876, the total was 1,988,806; so that there had been an increase of 251,122. There were 68,126 inhabited houses: and 2,075,800 of the inhabitants were French by birth; the foreigners numbering 91,872 males and 75,542 females, consisting of 45,281 Belgians, 31,190 Germans, 21,547 Italians, 20,810 Swiss, 10,789 English, 5,987 Americans, and 65 Chinese.

MEDICAL LEGISLATION.*

By HENRY O. MARCY, A.M., M.D., President of the Association.

THE history of legal medicine in Massachusetts has more than a local interest, and a brief review will prove instructive.

The Massachusetts Medical Society was incorporated in 1781. It was given "corporate powers; authorized to sue and be sued; to elect to membership; to suspend, expel, or disfranchise members; to make laws for the government of the Society; and was also authorized to issue letters testimonial, under the seal of the Society, to such as were found skilled, to the approbation of the examiners, as medical practitioners. A penalty of one hundred pounds sterling was fixed upon the Society and its officers if they should obstinately refuse to examine any one who presented himself for examination." In 1788 it was required "to prescribe such a course of medical and surgical instruction, and such qualifications as they should judge requisite for candidates for the practice of physic or surgery, and to cause the same to be published annually in one or more newspapers in each of four medical districts provided for in the State." In 1802 "the examiners and censors of the Society were required to examine all who should offer themselves to be approved as practising physicians or surgeons, who had received such an education as was, or might be from time to time, prescribed by the regulations of the Society." An applicant need not be a graduate of any college, but, "anybody who came up to the published standard was entitled to examination, and to be licensed if found qualified; and they were required to give every candidate whom they should approve a license to practise physic or surgery, or both."

In 1819 the Massachusetts Medical Society was authorized "to appoint examiners in each county, who should examine all applicants who had pursued the course of study required by the Society, and give license to such as were found qualified according to that standard, and also provided that every

* The annual address before the Association of American Medical Editors, April 27, 1885. Concluded from p. 74 (July number).

person licensed by the Society to practise, should file a copy of his license with the town clerk of the town where he practised." It was further provided by an act in 1818, that "any person who had been admitted to the practice of physic or surgery out of the commonwealth, and had come into it to pursue the practice of the same, might present himself to either of the boards of examiners in the various districts as a candidate for examination, and if they were confident that the candidate had received an education agreeably to the regulations provided by the Society, they might license him without subjecting him to a new examination." In 1819, act in addition to said act, which provided that "no person entering into the practice of physic or surgery after the first day of July, 1819, shall be entitled to the benefit of the law for the recovery of any debt or fee for his professional services, unless he shall, previously to rendering these services, have been licensed by the officers of the Massachusetts Medical Society, or shall be graduated a doctor of medicine in Harvard University."

This interesting chapter in the history of the legislation of Massachusetts must be considered only in connection with the development of medical learning in America. When the Massachusetts Medical Society was organized, and for many years after, the larger number of physicians were taught only by the method of preceptorship, a kind of indenture, so to speak, by which the student was taken into the family and taught the various branches of his art, the compounding of medicines included. A very few of the more favored class were graduated from the European universities. As centres of medical teaching developed and degrees were granted therefrom, the necessity for such supervision by the Society became less, and as we have seen, in 1819, by legislative enactment, the degree of doctor of medicine from Harvard University was considered as equivalent to the license of the Society, since both were under State supervision. In the revision of the General Statutes in 1859, the power to prescribe a course of study and determine the qualifications of physicians and surgeons was omitted in the new codification, since it was assumed that the colleges were in ample power and constituted better custodians of such requirements. Much emphasis has been placed upon this history of legislation, and it has been

declared that Massachusetts has had experience which caused her to revoke any and all laws looking to the supervision of the practice of medicine. At the most this is a bare inference, and so far as I have been able to ascertain, no case ever occurred where it was even charged that the authority conferred upon the Massachusetts Medical Society was in any manner used to the detriment of the public good. Hon. J. H. Benton, Jr., a learned counsellor of law in Boston, made a long and labored argument, March 6, 1885, before the Committee on Public Health of the Massachusetts Legislature, to whom this question of legal supervision of the practice of medicine had been referred. (I am told the service was rendered for a very large fee, paid by a much-advertised "Professor" from New York, who favors Boston with his learning since the registration law of New York prevented him from longer practice in that metropolis.) Even Mr. Benton failed to find a history of detriment to the public good during the more than two generations of the supervision of the Society under legal requirement. He further states that we have got on very well in Massachusetts for the last quarter of a century without State supervision. This can only be accepted as a lawyer's interpretation, for the facts are too extraordinary for recital. In Boston alone there are a larger number of so-called doctors who are offering their services to the public, who have not graduated from a reputable medical college, than all the graduates of the various schools combined. But this is not the worst side of the lack of legal supervision. Even houses of disrepute are covered by the name of "Dr. ——," and our newspaper columns contain advertisements, under the guise of so-called medical treatment, which mislead and bring to ruin, soul and body, multitudes of both sexes. Abortionists, despite the penal code, flourish at the low fee of ten dollars, so rarely are there convictions under the present laws. One Mrs. Bemis came to her death from having been for a period of two or three days kept wrapped in flannel saturated in kerosene oil, by the order of one "Dr." Pierce. Conviction followed under the ruling of Judge Pitman. "It is not necessary to show evil intent; if by gross or reckless negligence the defendant caused the death, he is guilty of culpable homicide." A sentence of six years in State's prison was rendered.

From this it has been argued that under the existing law the protection is ample. Shall we be content to say, Why care we for thieves if they are punished for their depredations? It is not alone "negligence, even if gross or reckless," from which the public should seek protection, but the rather ignorant men unfitted for their calling, the malicious and designing who seek out the thoughtless and unwary to their detriment and injury.

Let the title of "Doctor in Medicine," the name given by the schools to the graduates of the universities during the centuries, be a guarantee to the public that the one who assumes such title has in evidence thereby been, in a certain degree at least, fitted for the responsible position of attending upon the people in their illness. Let this title again be further qualified by State supervision, that the public may have further guarantee of fitness. This, in my own judgment, is the first requisite of legislation, and if all others be prevented from assuming to practise medicine under this *title*, the protection of the public interest is ample. The first appears simple and fundamental; the second demanded, because in the multiplicity and rivalry of the schools of medicine the State standard of requirement will be much more likely to secure uniformity and excellency of qualification. This subject is by no means, as has been so often asserted, a question between the different schools of medicine. It is the differentiation between learning and ignorance, competency and incompetency. Says Mr. Benton: "If he does not cure me; if he is negligent; if he has not the skill which he assumes to have, why, then, he is liable to me in damages. If he is grossly and wilfully and presumptuously ignorant and negligent, and he injures me, he is liable criminally. I need no other protection. The people need no other protection."

Does locking up the thief return the property; the incarceration of the incendiary rebuild the house; the hanging of the murderer restore the life? We punish to restrain and prevent such crimes. Would the public justly tolerate a class trained to steal, burn, or murder? Is it supposable that the shipwrecked crew would excuse the pilot who claimed he did not know the water in the channel was not sufficiently deep to float the noble ship with her priceless cargo? It was his business to know.

The fallacy in the arguments of nearly all who have opposed legislation is the unproved and unwarranted assumption that a certain limited class of physicians, stigmatized as "old-school" allopaths, regulars, etc., are the only parties interested in securing such legislation. Nothing is farther from the truth, and it is my own conviction that, aside from the desire which should actuate all honorable men to lessen, as far as possible, a recognized evil and to elevate a profession, with the honor or shame of which they are indissolubly connected, few, if any, would be found to advocate legislation except as a most disagreeable duty. At the annual meeting of the Homœopathic Medical Society of Massachusetts, held last month in Boston, the President, Dr. J. H. Smith, in his address said: "The profession in general and a few of the leading medical colleges recognize that this country is overrun by a swarm of incompetent practitioners. The more influential societies of America have united to raise the standard of medical education, and also of admission to professional studies. The day is approaching when, with justice, physicians may ask protection of the State of the special title of 'Doctor of Medicine' from being dragged in the mire of ignorance and sloth; and no one can fairly object to the passage of a bill providing for the inspection of diplomas and a proper registration. Whenever this shall be accomplished they may properly be regarded as members of the public service, and as such, a kind of board of health at large, having definite powers and entitled to adequate compensation in the courts, to exemption from jury and military service, and to protection against the assumption of their distinctive title, 'M.D.,' by people without inspected and approved diplomas." This society has unanimously petitioned the present legislature for some act of supervision of the medical practice within the State. Dr. John Perrins, in the annual address upon "Medical Legislation" before the Massachusetts Eclectic Medical Society in 1882, said: "To enforce colleges to do their whole duty should be the first step taken by our law-makers. After that is done it should be then a criminal offence for a person, under any circumstances or for whatever purpose, to make use of any title which is granted by a legally constituted college or body to which he is not duly and properly entitled. The province of legislation in a free country like our own is to protect the peo-

ple from deception and fraud. . . . The competent men of any school or business, the world over, do not need protection; and it would be both injustice and an injury to the people to have incompetent persons forced upon them by a monopoly. . . . We have laws in operation which will not allow the grocer to sell chicory and call it coffee; oleomargarine, and call it butter; but he may sell either for what it is. In this way the people are protected from fraud, and yet their rights are not interfered with in the least; neither the buyer nor the seller has any just ground for complaint. Why can we not have the same law applied to the practice of medicine? . . . I would not interfere with any persons entering upon the practice of medicine who wished to do so; but I would compel them to place themselves before the people in their true colors, reserving to the people their right to employ Thomas Jones or Mary Brown to treat them when sick, if they preferred."

I have quoted more fully from this thoughtful address, since it was written in *opposition* to medical legislation for the avowed distrust which he, as a practitioner of eclecticism, had in co-operation with other societies, to secure that which he so freely confesses would be for the public good.

It has also been claimed that, with all the pretence of medical teaching and the combined learning of the ages, "as yet there is no standard by which you can regulate the practice of medicine." Here again I suppose reference is made to the so-called schools and societies—ethical differences which necessarily hold little part in the science of medicine.

If the *science* of medicine is based upon the knowledge of the human body in health and disease, and the *art* of cure consists in the application of that knowledge to the readjustment and harmonious working of nature's laws, have we not in this a just and well-recognized standard for guidance! Is not surgery in large measure demonstrated by an intimate knowledge of a multitude, it is true, but of objective factors?

The sooner the public is disabused of the thought that the medical profession possesses the power, by the compounding of medicines under the split-footed ℞ sign, invoking thereby the benediction of Jupiter, and thus exorcising our physical evils, or granting absolution of our physical sins, by the administration of drugs, the better for all. Says a learned objector,

"All we want to preserve is the right of every man and woman of full age and sound mind to have such person minister to them in disease or sickness as they wish." This, indeed, should be fully granted. However, let every man do business under his right name and title. If those claiming divine guidance to cure by the laying on of hands can restore to health, Heaven speed the effort. If so-called Christian science brings into relationship the laws of God and man for the cure of physical ill, the sooner its claims are demonstrated the better. The contest is with ignorance and evil, not with knowledge or science, which in any of its multitudinous subdivisions of research we are willing to believe is divine, is Christian.

Many are the so-called *trade-marks* in life. Medicine, as a science, was supposed to be as broad as humanity and its ills; and, notwithstanding the blundering which is necessary in all experimental research, none have doubted the efforts of the past as equally honest and sincere as those of the present. Investigation has never been under the ban of the medical profession, but on the contrary, encouraged ever since the days of the alchemist. Homœopathy secured to itself the distinction of an abstract theory, to which few of its followers give more than a quasi-approval. Eclecticism claims the power of selection, freely granted since the days of Hippocrates, and yet, by a contrariety of terms, this freedom is emphasized by the rejection of all save botanic remedies. Our spiritualistic friends claim aids supernal, equal to their physical salvation from suffering, yet they freely confess it is limited to a narrow working of a hidden force, which as yet they are permitted to see as "only through a glass darkly." As the latest of modern revelations comes the new assumption of "Christian science." These teachings of the Divine Master, at the most but improperly understood, and their benefit lost during all these centuries, until now these new disciples declared the revealed will. The assumption is extraordinary. Its boldness, very audacity, challenges a sort of admiration and wins favor.

I quote from its great feminine apostle in her latest publication: "Christian science must be interpreted spiritually; until thus discerned it should not be judged. To have fair play I offer to clergymen gratuitous instruction; if they give me this chance I will guarantee they shall understand Christian sci-

ence sufficiently to demonstrate it conclusively by healing the sick." We cannot wonder such a trade-mark, no matter how honestly assumed, brings upon it the denunciation of the leaders in theological teaching; and the only reply to such opposition is fittingly their own, as in their effort to secure sympathy, they, in this nineteenth century, compare themselves to the martyrs of old. To limit the Christian workings of religion in science to the cure of disease, an infraction or modification of physical law must be considered, from any stand-point, at least reprehensible, and most persons would concede that while spiritual things are to be interpreted spiritually, the converse of the proposition would hold equally good. Let the laws of petition to Almighty God be better understood, and our faith in a personal deity would be greatly increased. It seems but yesterday when the prayers of a great nation were offered for the restoration to health of our late lamented President Garfield. The bacterial colonization and development went on, however, under the law of its own reproduction, uninterruptedly, to his death. What more pertinent illustration than that of Christ in his rebuke of the tempter, that the law of gravitation should be held in abeyance, in his special instance, by the Father's interposition! If miracles are again to be inaugurated, they should work now, as of old, for the establishment of a principle, rather than for a personal good.

We think we have already clearly shown that the supervision of the practice of medicine does not belong to the so-called "class" legislation, but is in recognition of a need as universal as the ills of humanity.

It is too late to claim that such measures are exceptional, in the interest of the individual, unconstitutional, etc. Twenty-six States have already passed laws in remedy of a great evil. The supreme courts have affirmed the constitutionality of these measures. Last month North Carolina passed an enactment, making her laws regulating the practice of medicine yet more effective. The present month, the Medical Examining Board of Virginia held its first meeting. The examination was a written one, and the lists of questions are now published. Twenty-five applicants, all but one graduates from reputable medical colleges; six were rejected.

The extraordinary advances in modern medical science have kept pace with other departments of learning. Many States

have very properly recognized this by the establishment of boards of health, and their efficient working is acknowledged in the diminution and control of disease. In the solution of the difficult problems pertaining to the infectious diseases, their laws of development and their control, what wiser service for the public good could our legislators enact, than provisions for their better study and knowledge?

Conservative Germany, as well as republican France, has won imperishable glory and renown by such investigation; and benefits have accrued deserving the world's gratitude.

Aside to the questions pertaining to the physical well-being of her inhabitants, untold millions of America's wealth are invested in her flocks and herds, upon ten thousand times ten thousand hills and plains. How little do we know of comparative pathology, and how few men have we fitted to teach the lessons of profit to be derived therefrom!

May our new National Board of Health be seconded in its wise efforts by the profession of our entire country.

Let the States provide for the establishment of their own laboratories, for the study of the diseases within their borders. May the medical profession, in accord with the history of the past, continue on in the even tenor of its noble calling, content to feel that the highest ambition of its members is found in the alleviation of suffering and the restoration to health; and if an honest man is the noblest work of God, that he must necessarily be *mens sana in corpore sano.*

FRICTIONAL ELECTRICITY.—Electricity is frequently caused by the friction of belts on pulleys, a fact known in Germany for a long time, but first described in our country by Mr. F. W. Whiting. This has been the cause of fires, and should be guarded against by connecting all parts on which the electricity accumulates with the ground, by means of wires attached to the object and to a gas- or preferably water-pipe. This is one of the most prolific sources of fire in the heavy coating-rooms of oil-cloth factories, as the electric sparks readily ignite the benzine vapors present. In one of the largest Philadelphia works of this kind, the iron receiving-racks were so charged with electricity that long sparks could be drawn from them, but since they have been properly "wired" not a trace of electricity is left in them.—*Journal of the Franklin Institute.*

THE PROGRESS OF STATE MEDICINE IN MINNESOTA.*

EDITOR OF THE SANITARIAN—

DEAR DOCTOR: Your number for July, under the head, "Progress of State Medicine in Minnesota, comprehending the most recent laws," reprints our general law of *1883*. I send you herewith copies of the acts of 1885, which I hope you will note under the same heading in simple justice to us, as they take us a long way ahead of the record of 1883.

1. Amending the act of 1883 as respects local boards of health, and making the organization of all local boards compulsory, under the general law, and in direct relation to the State board.

2. An act to regulate offensive trades and employments.

3. An act to prevent the spread of infectious and contagious diseases.

4. An act to prevent the pollution of rivers and sources of water-supply.

5. An act appropriating $15,000 to meet expenses of the State Board of Health, if necessary, occasioned by cholera.

They consolidate our work and that of the local boards, not only for men but for animals. The excerpts from the "Act to prevent pollution of rivers and sources of water-supply" show the relations of the State Board of Health thereto. As you are probably aware, we have a thoroughly organized laboratory, where water-analysis particularly has been done regularly since 1877. The work now includes, besides the regular analysis of public water-supply (and special analysis, as occasion requires), the examination of disinfectants, and antiseptics, and articles of food and drink.

Yours truly,

CHARLES N. HEWITT, M.D.,
Secretary and Executive Officer of the State Board of Health of Minnesota.

RED WING, MINN., August 11, 1885.

* Continued from page 63 (July number).

AN ACT TO AMEND CHAPTER ONE HUNDRED AND THIRTY-TWO (132) OF THE GENERAL LAWS OF THE YEAR OF OUR LORD ONE THOUSAND EIGHT HUNDRED AND EIGHTY-THREE (1883), RELATING TO BOARDS OF HEALTH.

SECTION 1. That section four (4) of chapter one hundred and thirty-two of the General Laws of the year of our Lord one thousand eight hundred and eighty-three (1883) be and the same hereby is amended so as to read as follows:

"The town supervisors of each town, together with a physician to be employed by said supervisors when in their judgment necessary, or when ordered by the State Board of Health, shall constitute a board of health, and all villages, boroughs, and cities shall have a board of health to be chosen and to consist of the number hereinafter provided, anything in the charter of any such village, borough, or city to the contrary notwithstanding. Such boards shall, within their respective towns, villages, boroughs, and cities, have and exercise all the powers necessary for the preservation of the public health. Said village, borough, or city board shall consist of not less than three (3) members, one (1) of whom shall be a physician, and such physician shall be health officer and executive officer of the board, and shall receive such compensation for his services as the council or other body answering thereto, of the village, borough, or city, shall determine. Said board shall be elected by the council, or other body answering thereto, of each village, borough, and city, on the first Monday of April, in the year of our Lord one thousand eight hundred and eighty-five. One member of such board shall be elected for and hold such office for the term of three (3) years, one for two (2) years, and one for one (1) year, and one member of such board shall be so elected annually thereafter, and all vacancies occurring in said board shall be filled in like manner.

"It shall be the duty of the health officer to perform and superintend the work prescribed in this act, and shall perform such other duties as the board may require. He shall furnish to the board such information cognate to this act as from time to time they may deem necessary, and to make once in each year, in the month of May, and oftener if necessary, a thorough sanitary inspection of said town, village, borough, or city,

and present a written report of such inspection at the next meeting of the board of health, and he shall forward a copy of said report as soon as rendered to the State Board of Health; and he may at any time, when necessary, examine into all nuisances, sources of filth and causes of sickness, and said board may make such regulations respecting the same as they may judge necessary for the public health and safety of the inhabitants; and every person who shall violate any order or regulation made by any board of health, and duly published, shall be deemed guilty of misdemeanor, and punished by a fine not exceeding one hundred dollars ($100), or by imprisonment in the county jail not exceeding three (3) months."

SEC. 2. That section twenty-nine (29) of said chapter be and the same is hereby amended so as to read as follows:

"All expenses so incurred for the control of infectious disease by any town or village board of health hereafter shall be audited by the county commissioners and paid out of the county treasury by orders on the treasurer drawn by the county auditor, and paid out of the general revenue fund of the county as other claims against the county are audited and paid. All expenses hereinafter incurred by any city board of health shall, in the first instance, be borne and paid out of the city treasury. The proper authorities of said city shall certify the amount required to reimburse said city, to the county auditor at the time of certifying other taxes, and such auditor shall extend on the tax-list of the county a tax sufficient to pay the amount so certified, which tax shall be collected as other taxes and paid over to the treasurer of such city."

AN ACT REGULATING OFFENSIVE TRADES AND EMPLOYMENTS.

SECTION 1. The board of health of each town in this State shall from time to time assign certain places within such town for the exercise of any trade or employment which is a nuisance or hurtful to the inhabitants, or dangerous to the public health, or the exercise of which is attended by noisome or injurious odors, or is otherwise injurious to the estates of such inhabitants; and may prohibit the exercise of such trade or employment in places not so assigned. Said board may also forbid such exercise within the limits of the town or particular locality thereof. All such assignments shall be entered in the

records of the town, and may be revoked when said board shall think proper.

SEC. 2. It shall not be lawful for any person or corporation to exercise within any town any trade or employment mentioned in section one of this act without having first obtained from the board of health of such town permission so to do, and the assignment provided in said section; and any person or corporation violating the provisions of this section shall forfeit and pay the sum of fifty dollars for each and every day that any such trade or employment is exercised or carried on, to be recovered in any court having jurisdiction thereof and sitting within the county wherein such trade or employment is exercised or carried on. Such action shall be commenced and prosecuted by such board in its name and for its benefit.

SEC. 3. When any assignment mentioned in section one hereof shall be revoked, said board shall serve upon the occupant, corporation, or person having charge of the premises where such trade or employment is exercised, a written notice of such revocation. If the person or corporation upon whom such order is served for twenty-four hours after such service refuses or neglects to obey the same, said board shall take all necessary measures, by injunction or otherwise, to prevent such exercise; and the person or corporation so refusing or neglecting shall forfeit and pay the sum of one hundred dollars for each and every day that such trade or employment shall be exercised after the service of such notice, to be recovered in the manner and by the party and for the benefit as provided in section two hereof.

SEC. 4. Any person or corporation aggrieved by any order of such board may appeal therefrom to the district court of the county in which such trade or employment is exercised. Such appeal shall be taken by the filing by such aggrieved person or corporation within five days after the service of such order, in the office of the clerk of said court, of a notice of such appeal, together with a bond in the sum of not less than five hundred dollars, with two or more sureties to be approved by the judge of said court, conditioned for the prosecution of such appeal to judgment, and for the payment of all costs and expenses that may be awarded against such appellant, and by the service of a copy of such notice and bond upon such board.

If such appeal be taken within twenty days next before the time appointed for holding a general term of said court within said county, the same shall be heard at such time as other civil causes, and at the request of either party shall be tried by jury. If such appeal is taken more than twenty days before any such term, the judge shall, by order, appoint a time and place for the hearing of such appeal, and shall, if the appellant demand a trial by jury, direct the sheriff of such county to summon a jury of twelve persons having the qualifications of jurors to appear at the time and place named in said order to serve as jurors in said cause. Any person so summoned may be challenged as in civil actions. If a sufficient number of such persons so summoned do not appear, the court shall require talesmen to be called as in other cases, and said appeal shall be tried as other civil causes. During the pendency of such appeal such trade or employment shall not be exercised contrary to the order of said board; and upon the violation of any such order the appeal shall forthwith be dismissed. Upon the return of the verdict of the jury the court may either alter or amend the order of the board or affirm or amend it in full to conform to such verdict. If the matter be tried by the court it shall have and exercise the same powers.

SEC. 5. Any person injured either in his comfort or the enjoyment of his estate by the exercise of any such trade or employment may have and maintain an action for the damages sustained thereby.

SEC. 6. When it appears on a trial before the district court for the proper county, upon a complaint made by any person that any place or building assigned as provided in section one of this act has become a nuisance, by reason of offensive smells or exhalations proceeding from the same, or is otherwise hurtful or dangerous to the neighborhood or to travellers, said court may revoke such assignment and prohibit the further use of such place or building for the exercise of either of the aforesaid trades or employments, and may cause such nuisance to be removed or prevented.

SEC. 7. When any building or premises within any city, village, or town, are occupied or used for the exercise of any trade or employment aforesaid, the State Board of Health shall, upon application made to it for that purpose, appoint a time

and place for hearing the parties, and give notice of not less than ten days thereof to the complainant and the party against whom such application is made, and after such hearing may, if in its judgment the public health or the public comfort and convenience so require, order any person to desist and cease from further carrying on such trade or occupation in such building or premises; and any person or corporation thereafter continuing to occupy such building or premises shall forfeit and pay the sum of one hundred dollars for every day of such occupancy or use—to be recovered in any court having jurisdiction thereof by action commenced and prosecuted in the name of the board of health of such city, village, or town, and for its use and benefit. Any person or corporation aggrieved by any such order may appeal therefrom, and said appeal shall be taken, prosecuted, and determined in the same manner provided in section four of this act. During the pendency of such appeal such trade or employment shall not be exercised contrary to the orders of said State board; and upon the violation of any such order the appeal shall forthwith be dismissed.

SEC. 8. The district court or the judge thereof may issue an injunction or other proper writ to enforce the orders of said State board issued under the provisions of this act.

SEC. 9. Nothing in this act contained shall be so construed as to impair any other remedies which may exist in cases of nuisance.

AN ACT TO PREVENT THE SPREAD OF CONTAGIOUS OR INFECTIOUS DISEASES AMONG CATTLE.

SECTION 1. The local boards of health of towns, villages, and cities, in the case of the existence in this State of the disease called pleuro-pneumonia among cattle, or farcy or glanders among horses, or any other contagious or infectious disease among domestic animals, shall cause the animals in their respective towns, villages, or cities, which are infected or which have been exposed to infection, to be secured or collected in some suitable place or places within their respective towns, villages, or cities, and kept isolated; and, when taken from the possession of their owners, one-fifth of the expense of their maintenance shall be paid by the town, village, or city

wherein the animal is kept, and four-fifths by the State, such isolation to continue as long as the existence of such disease or other circumstances may render it necessary.

SEC. 2. The said local boards of health, when any such animal is adjudged by a veterinary surgeon or physician, by them selected, to be infected with any contagious or infectious disease, may, in their discretion, order such diseased animal to be forthwith killed and buried at the expense of such town, village, or city.

SEC. 3. The said local boards of health may cause all such animals that have been within the State for —— months next preceding the adjudication mentioned in section two to be appraised by three competent and disinterested men under oath, at the value thereof at the time of the appraisement, and in making such appraisement the appraisers shall take into consideration the fact of the existence of such disease in such animals, and the amount of the appraisement shall be paid as provided in section one, except as provided in section fifteen of this act.

SEC. 4. The said local boards of health may, within their respective towns, villages, and cities, prohibit the departure of animals from any enclosure, or exclude animals therefrom.

SEC. 5. The said local boards of health may make regulations in writing, to regulate or prohibit the passage from, to, or through their respective towns, villages, or cities, or from place to place within the same, of any cattle or other domestic animals, and may arrest and detain, at the cost of the owners thereof, all animals found passing in violation of such regulations, and may take all necessary measures for the enforcement of such prohibition, and also for preventing the spread of any disease among the animals to their respective town, village, or city, and the immediate vicinity thereof.

SEC. 6. Such regulations shall be recorded upon the records of their respective towns, villages, and cities, and shall be published in such towns, villages, and cities, in such manner as may be provided in such regulations.

SEC. 7. Any person disobeying the orders of said local boards of health, made in conformity with the preceding provisions, or driving or transporting any animals contrary to the regulations made, recorded, and published as aforesaid, shall

be punished by a fine of not less than one hundred dollars nor exceeding five hundred dollars, or by imprisonment of not less than —— nor exceeding one year.

SEC. 8. Whoever knows or has reason to suspect the existence of any such disease among the animals in his possession, or under his care, shall forthwith give notice thereof to the said local boards of health of the town, village, or city where such animals are kept, and for failure so to do shall be punished by a fine of not less than fifty dollars nor exceeding five hundred dollars, or by imprisonment of not less than —— nor more than one year.

SEC. 9. Any member of any local board of health who neglects or refuses to carry into effect the preceding provisions, shall be punished by a fine of not less than one hundred dollars nor more than five hundred dollars for each day's neglect.

SEC. 10. When the State Board of Health make and publish any regulations concerning the extirpation, care, or treatment of animals infected with, or which have been exposed to, any contagious disease, such regulation shall supersede those made by the local boards of health, and said local boards of health shall carry out and enforce all orders and directions of the State Board of Health to them directed.

SEC. 11. The State Board of Health shall have all the power and authority herein conferred upon local boards of health.

SEC. 12. The local boards of health, within twenty-four hours after they have notice that any domestic animals in their respective towns, villages, and cities, are infected with or have been exposed to any such disease, shall give notice thereof in writing to the State Board of Health.

SEC. 13. The State Board of Health may make all necessary regulations for the quarantine of such animals, and extirpation of such disease, and may direct local boards of health to enforce and carry into effect all such regulations as may from time to time be made for that end; and any member of any such local board of health who refuses or neglects to enforce or carry out any regulation of the State Board of Health shall be punished by a fine of not less than —— dollars, nor more than five hundred dollars, for every such offence.

SEC. 14. The State Board of Health, when in their judgment the public good requires it, may cause to be killed and buried any domestic animals which are infected with, or have been exposed to such disease; and, except as provided in the following section, shall cause such animals to be appraised in the manner provided above, and the appraised value of such animals shall be paid, one-fifth by the town, village, or city, in which such animals were kept, and the remainder by the State.

SEC. 15. In all cases of farcy or glanders, the State Board of Health, having condemned the animal infected therewith, shall cause such animal to be killed, without an appraisement or compensation to the owner thereof, but may pay the owner an equitable sum for the killing and burial thereof.

SEC. 16. A person who fails to comply with the regulation made, or an order given by the State Board of Health, shall be punished by fine not exceeding five hundred dollars, or by imprisonment not exceeding one year.

SEC. 17. All appraisement made shall be in writing, and signed by the appraisers and certified by the local boards of health or State Board of Health respectively, to the governor and to the treasurer of the several towns, villages, and cities wherein the cattle appraised were kept.

SEC. 18. The State Board of Health may examine under oath all persons believed to possess knowledge of material facts concerning the existence or dissemination or danger of dissemination of diseases among domestic animals; and for this purpose shall have all the powers vested in justices of the peace to take depositions and to compel witnesses to attend and testify. All costs and expenses incurred in procuring the attendance of such witnesses shall be allowed and paid to the State Board of Health from the treasury of the State, upon being certified to and approved by the governor.

SEC. 19. Whenever animals exposed to contagious diseases or killed by order of the State Board of Health, and upon a post-mortem examination are found to have been entirely free from disease, the State Board of Health shall cause the same to be sold under their direction, first giving to the purchaser notice of the facts, and if said purchaser, or any person, shall sell said slaughtered animals or any part thereof, he shall in like manner give notice to the parties to whom such sales are made;

and the proceeds of the sales made by order of the State Board of Health shall be applied in payment of the appraised value of said animals.

SEC. 20. Whoever violates any of the provisions of the preceding section shall be punished by fine not exceeding one hundred dollars and the cost of prosecution.

SEC. 21. The State Board of Health shall keep a full record of their doings, and report the same to the legislature, unless sooner required by the governor.

SEC. 22. The State Board of Health may, by order, require any two (2) or more local boards of health to act together for the purposes of the provisions of this act.

SEC. 23. The sum of three thousand dollars ($3,000) is hereby appropriated for the payment of expenses incurred by the State in enforcing this act. Said expenses to be approved by the State Board of Health and by the governor.

AN ACT TO PREVENT THE POLLUTION OF RIVERS AND SOURCES OF WATER-SUPPLY.

SECTION 1. No sewage, drainage, or refuse or polluting matter of such kind as either by itself or in connection with other matter will corrupt or impair the quality of the water of any spring, well, pond, lake, stream, or river for domestic use, or render it injurious to health, and no human or animal excrement shall be placed in, or discharged into, or placed or deposited upon the ice of any pond, lake, stream, or river used as a source of water-supply by any town, village, or city, nor shall any such sewage, drainage, refuse or polluting matter, or excrement, be placed upon the banks of any such pond, lake, stream, or river within five miles above the point where such supply is taken, or into any feeders or the banks thereof of any such pond, lake, stream, or river.

SEC. 2. The State Board of Health shall have the general supervision of all springs, wells, ponds, lakes, streams, or rivers used by any town, village, or city as a source of water-supply, with reference to their purity, together with the waters feeding the same, and shall examine the same from time to time, and inquire what, if any, pollution exist and their causes. In case of a violation of any of the provisions of section one of this act, said board may appoint a time and place for hearing parties to be affected, and shall give due notice thereof as

hereinafter provided to such parties, and after such hearing, if in its judgment the public health requires it, may order any person or corporation or municipal corporation to desist from the acts causing such pollution, and may direct any such person or corporation to remedy the pollution, or to cleanse or purify the polluting substances in such a manner and to such a degree as shall be directed by said board before being cast or allowed to flow into the waters thereby polluted, or placed or deposited upon the ice or banks of any of the bodies of water in the first section of this act mentioned.

Upon the application of the proper officers of any town, village, or city, or of not less than ——— legal voters of any such town, village, or city, to said State board, alleging the pollution of the water-supply of any such town, village, or city by the violation of any of the provisions of this act, said State board shall investigate the alleged pollution, and shall appoint a time and place when and where it will hear and examine the matter, and shall give notice of such hearing and examination to the complainant, and also to the person or corporation or municipal corporation alleged to have caused such pollution, and such notice shall be served not less than ten days prior to the time so appointed, and shall be served in the same manner that now is or hereafter may be by law provided for the service of a summons in a civil action in the district court.

Said board, if in its judgment any of the provisions of this act have been violated, shall issue the order or orders already mentioned in this section.

SEC. 3. The district court, or the judge thereof, may, upon the complaint of said State board, or of the proper authorities of any town, city, or village whose sources of water-supply shall be so polluted, issue an injunction to enforce the orders of said State board.

SEC. 4. Such orders of the State board shall be served upon the persons, corporations, or municipal corporations found to have violated any of the provisions of this act, and any party aggrieved thereby shall have the right to appeal to the district court of the county in which is situate the town, village, or city whose source of water-supply is found to have been polluted, and such aggrieved party shall have the right to a trial by jury in the same manner as in a civil action in

said court. During the pendency of the appeal the pollution against which the order has issued shall not be continued contrary to the order of the State board, and upon the violation of the order the appeal shall forthwith be dismissed.

SEC. 5. Any person, corporation, or municipal corporation desiring to appeal from any such order of the State board shall, within thirty days after the service upon him or it of a copy of such order, file in the office of the clerk of the district court of the proper county a notice of such appeal, together with a bond in the sum of not less than two thousand dollars, with two sureties to be approved by the judge of said court, conditioned for the prosecution of such appeal to judgment, and for the payment of all the costs and disbursements that may be adjudged against him or it therein, and shall within three days after such filing serve a copy of such notice and bond upon the secretary of said board; and said secretary shall within ten days thereafter deliver such copies so served upon him to the mayor or other chief executive officer of any such city, village, or town whose source of water-supply has been found to have been so polluted.

SEC. 6. Water boards, water commissioners, water companies, and the proper officers of any city, village, or town making use, as a source of water-supply, of any well, spring, pond, lake, stream, river, reservoir, or well within or partly within this State, and distributing the waters thereof for public, domestic, and general uses, shall from time to time, and whenever required by said State board, make returns to said board upon blanks to be furnished by it of such matters as may be required by said board and called for by such blanks; and any such water board, water commissioners, water company, or officer of any city, village, or town who shall, for the space of thirty days after being furnished with such blanks, fail or neglect to make any such report so required shall for each and every such neglect or failure forfeit and pay the sum of one hundred dollars for the use of the local board of health, or the proper officer acting as such of the city, town, or village where such delinquent has its principal office. Said State board shall in the name of the State prosecute in the district court of the proper county an action for the recovery of the penalty or forfeit herein imposed.

AN ACT TO APPROPRIATE MONEY TO MEET THE EXPENSES OF THE STATE BOARD OF HEALTH, ARISING FROM AN EMERGENCY THAT MAY ARISE FROM CHOLERA IN THE STATE.

SECTION 1. That the sum of fifteen thousand dollars ($15,000), or so much thereof as may be necessary, be and the same is hereby appropriated out of any money in the treasury not otherwise appropriated for the purpose of meeting and paying the expense which may be incurred by the State Board of Health in any emergency that may arise from cholera in this State.

SEC. 2. That said money shall be expended under the direction of the governor, and shall be paid out on the warrant of the State auditor. Vouchers for such expenditures, giving the details thereof, approved by the governor, shall be filed with the State auditor.

POISONOUS CHEESE.*

By PROFESSOR C. VAUGHAN, M.D., PH.D.

IT is well known that cases of severe illness follow the eating of some cheese. Such instances are of frequent occurrence in the North German countries and in the United States. In England they are less frequently observed; while in France, where much cheese is made and eaten, these cases are said to occur very rarely. A few years ago, the reputation of a large cheese-factory in Northern Ohio was destroyed by the great number of cases of alarming illness arising from eating its cheese. Dairymen know this cheese as "sick" cheese.

Of the kinds of cheese that are poisonous, a German author says: "The numerous kinds of soft cheese, prepared in small families or on small farms, are generally the cause of the symptoms; while it is quite exceptional to hear of symptoms arising from the use of cheese prepared in large quantities." Some two years ago, a family in Alpena, Mich., was poisoned

* Abstract of a paper read at the meeting of the Michigan State Board of Health, July 14, 1885.

by eating of cottage-cheese; but the cheese which poisoned so many in this State last year was made at one of the largest factories in the State, and by a thoroughly experienced cheese-maker. The old foul-smelling cheese, such as Limburger and Schweitzer, have never been known to be poisonous.

The symptoms produced by "sick" cheese, as reported by German and American physicians, agree quite closely, and are as follows: Dryness of the mouth and throat, with a sense of constriction, nausea, vomiting, diarrhœa, headache, sometimes double vision, and marked nervous prostration. In rare instances the sufferer dies from collapse. As a rule recovery occurs in a few hours, or at most after a few days. The symptoms of cheese-poisoning and those of sausage, canned-meats, and fish poisoning are very similar; though death results more frequently from the others mentioned than from cheese-poisoning.

Appearance of the cheese.—The samples of cheese examined had no peculiarities of appearance, odor, or taste by which it could be distinguished from good cheese. It is true that if two pieces of cheese—one poisonous and the other wholesome—were offered to a dog or a cat, the animal would select the good cheese. But this was probably due to an acuteness of the sense of smell possessed by the animal and not belonging to man. Indeed, if a person tasted a cheese knowing that it was poisonous, he might detect a sharpness of taste which would not ordinarily be noticed.

There is no certain means, aside from a chemical examination, by which a poisonous cheese can be distinguished from a wholesome one. The most reliable ready method is probably, as follows:

Press a small strip of blue litmus paper (which can be obtained at any drug-store) against a freshly cut surface of the cheese, if the paper is reddened instantly and intensely the cheese may be regarded with suspicion. When treated in this way any green cheese will redden the litmus paper, but ordinarily the reddening will be produced slowly and will be slight. If the piece of cheese be dry, a small bit should be rubbed up with an equal volume of water, and the paper should then be dipped in the water. The above test is not free from error, but it is the most reliable ready means now known. Every grocery-

man should apply this test to each fresh cheese which he cuts. The depth of the reddening of the paper may be compared with that produced by cheese which is known to be wholesome.

Effects on the lower animals.—Dogs and cats, at least, are not affected by eating poisonous cheese. This is probably due to the fact that they do not get enough of the poison from the amount of cheese which they eat. The pure isolated poison in sufficient doses would undoubtedly produce upon the lower animals effects similar to those produced on man.

Nature of the poison.—Dr. Vaughan has succeeded in isolating the poison, to which he has given the name *tyrotoxicon* (from two Greek words which mean cheese and poison). It is a product of slight putrefaction in the cheese which probably occurs in the vat, as the curd has been known to poison a person. By this slight putrefaction, or excessive fermentation as it may be called, a large amount of butyric acid is formed, and this in the presence of the casein of the cheese is capable of developing a poison. Different samples of poisonous cheese contain different amounts of the poison. The same weight of cheese from one cake furnished three times as much poison as that from another cake. The poison was obtained in long needle-shaped crystals, which are freely soluble in water, chloroform, alcohol, and ether. The smallest visible fragment of a crystal placed upon the end of the tongue causes a sharp stinging pain at the point of application, and in a few minutes dryness and constriction of the throat. A slightly larger amount produces nausea, vomiting, and diarrhœa. The poison is volatile at the temperature of boiling water, and for this reason even poisonous cheese may be eaten with impunity after being cooked. The substance has also a marked, pungent odor, and through the nose one can obtain sufficient of the volatile poison to produce dryness of the throat. This is true, however, only of the isolated poison. In the cheese the taste and odor of the poison are both modified to such an extent that they would not be recognized, as has already been stated.

The first step in the study of cheese-poisoning has now been taken, by finding out what the poison is. Efforts will be made to ascertain the means for preventing its formation.

ATMOSPHERIC HUMIDITY.*

By G. V. Poore, M.D.

THERE is yet another gaseous element of the atmosphere which is absolutely universal, although the amount which is present varies immensely under different conditions. This is watery vapor.

Although this vapor is invisible, we are constantly being reminded of its presence. The moisture that condenses on the cool window-panes of a crowded room, or that dims the surface of a tumbler of iced water which one may be lucky enough to get at some suffocative dinner, are among the every-day evidences that watery vapor is present in the air and ready to condense.

Air is only capable of keeping a certain definite amount of watery vapor in an invisible condition. For equal barometric pressures the amount varies with the temperature. The higher the temperature, the greater is the amount of vapor which the air will hold invisible. At a freezing temperature each cubic foot of air will hold just over two grains of watery vapor, while at a temperature of 100° Fahr. the amount which the air will retain is close upon twenty grains, or ten times as much. These figures are not precisely accurate, but they are near enough for our purpose and are easily remembered. When the air contains its maximum amount of watery vapor (an amount which increases with the temperature) it is said to be saturated, and if saturated air be cooled the moisture is deposited in the form of dew.

Rain, in like manner, is caused by the cooling of air saturated with moisture.

According as the moisture in the air falls short of saturation, so is its drying power and its power of causing the evaporation of fluids. If complete saturation be spoken of as 100°, then the relative humidity of the air may be stated as

* Abstract from a paper on "Climate in its Relation to Health," read before the Society of Arts, London, and published in the *Journal* of the Society.

a percentage of the maximum. Let us suppose that a cubic foot of air contains fifty per cent. of watery vapor. If the temperature of the air be 32° Fahr., then we shall know that each cubic foot (containing fifty per cent. of its maximum) holds about one grain of watery vapor, and is capable of drying up a second grain. If the temperature of the air, however, be 100° Fahr., we shall know that each cubic foot (containing fifty per cent. of its maximum) holds about ten grains, and that the drying power of each cubic foot is equal to another ten.

Now, it is important to bear in mind that although the air in both these imagined instances has a humidity of fifty per cent., yet the drying power is ten times greater at the higher temperature.

Since the drying power, *i.e.*, the power of causing evaporation, is that which exercises most influence on our health and comfort, it follows that humidity must always be considered in conjunction with temperature. When the drying power of the air is great, the evaporation of fluid from our skins and lungs is great. When the drying power of the air is small, the evaporation of moisture from the skin and lungs is small also. It follows from this that dry air is often of great use to persons suffering from what are known as chronic catarrhal conditions of the respiratory passages (throat, nose, windpipe, and bronchial tubes). The moist, mucous surfaces of these parts are, as it were, dried up by the dry air which is drawn over them, and the sufferings of the invalid are greatly lessened.

As regards the effect of the drying power of the air upon the skin, it is quite impossible to consider it apart from the question of temperature, because the amount of perspiration to be evaporated depends mainly upon the temperature (exercise being left out of consideration), and hence it follows that the amount of perspiration to be evaporated may be ahead of the drying power of the air. Hence it is not possible to consider the effect of drying power on the skin apart from the question of temperature, and we must therefore defer it until we come to talk of temperature.

The moisture in the air is due to the evaporating power of the sun. The heat of the sun is constantly raising water in the form of vapor; just as the water in a boiler is changed to

vapor by the glowing fuel. In tropical regions the amount of water which is changed to invisible vapor is prodigious, but the evaporation in temperate climates is also very great, for it must be remembered that this evaporation goes on so long as the moisture in the air falls short of saturation.

The watery vapor in the air is of the greatest importance from a meteorological, and, therefore, indirectly from a climatic, point of view. Mr. Scott, in his work on the "Elements of Meteorology," thinks that the distribution of moisture in the air is very local, and depends, to a great extent, on the proximity of free water-surfaces to supply the moisture. It is, therefore, great in the air over tropical seas, slight in the air over extensive tropical deserts. The amount of moisture is generally more or less in direct relationship with the temperature. The dryness of the air during a Canadian winter is well known. The water is, to a great extent, locked up in solid form, and the evaporating power of the air is slight, and hence the dry, crisp atmosphere, of the pleasures of which we hear so much. The amount diminishes as we ascend in a degree rather more than proportionate to the fall of temperature. The air of high mountains is relatively dry, but the degree of moisture follows no regular law, and it has been observed by balloonists, as well as mountaineers, that in ascending to great heights strata of air of varying degrees of moisture are passed through.

The watery vapor ever present in the air acts like a garment to the earth, an invisible robe protecting the surface of the earth, on the one hand from the scorching influence of direct solar radiations, and on the other hand preventing, to a great extent, the radiation from the earth itself, and the too rapid loss of heat when the sun goes down.

Like our own garments, the invisible watery garment of the earth moderates the heat and cold, and tends to produce equability of climate. In situations where the moisture in the air is slight, the extremes of temperature are excessive, as in flat sandy deserts and on mountains; the heat of the sun in these situations being in striking contrast to the bitter cold of the nights.

The watery vapor ever present in the air may become visible. Were I to bring a glass of ice-cold water into this

room, its surface would be dewed with moisture, because the air in contact with the glass being suddenly chilled, its capacity for moisture is lessened, and a part of it is deposited.

When the surface of the earth is suddenly chilled by radiation, dew is in like manner deposited from the strata of air in contact with it. When a clear night succeeds a hot summer day, the deposit of dew is always (in England) very large. Dew, it will be noticed, is always most abundant on grass and herbage, on the leaves and stems of trees, on wood and metal work, etc., while it is not present on gravel walks and in dusty roads. Dew is, in short, deposited on those bodies which lose their heat most readily by radiation.

The heaviest fall of dew which it has been my lot to witness was on a winter's morning in January, on board a yacht off Cagliari, in the island of Sardinia. I was roused about half-past seven by the pattering, as I thought, of heavy rain upon the deck, but on going on deck I found that the shower was exceedingly local, being produced by the deposit of dew upon the high spars and rigging of the yacht, and its subsequent descent upon the deck in a heavy shower. The power of the sun on the previous day had been very great, and had raised much vapor from the sea, and this moisture-laden air, being cooled by contact with the cold spars and rigging, discharged its moisture in the manner related.

Humboldt has recorded how, in some of the forests of South America, the traveller on entering a wood finds, apparently, a heavy shower falling, whilst overhead the sky is perfectly clear. The formation of dew takes place on the tops of the trees, and so copiously, owing to the abundance of vapor in a tropical atmosphere, that a real shower of rain is the result.

Fogs and mists are due, it is now generally supposed, to the condensation of moisture on the infinitely fine particles which are always suspended in the air. If the air be absolutely free from dust, watery vapor forms no mist, but the presence of solid impurity determines a fog. For the formation of fog three things are necessary:

1. The cooling of moisture-laden air.

2. Calm weather, so that the mist is not blown away as soon as formed.

3. Solid matter in the air.

When in winter the southeast wind blows, bringing moisture-laden air from the German Ocean and the Channel up the estuary of the Thames, and when this moist air comes in contact with the cooler air of London, charged with solid impurity to an enormous extent, a London fog is the result. The fogs of Newfoundland are due to the chilling of moist air by coming in contact with a surface of water cooled by melting ice.

Most of the water evaporated from the surface of the salt and fresh waters of the globe returns to the surface in the form of rain.

Rain is produced by the chilling of air more or less charged with moisture. Near the equator the hot air, charged with moisture, rises into the cooler regions of the atmosphere, and descends again as rain, and in torrents of which we have no knowledge in these latitudes. Air which has traversed a large tract of sea, like that which comes to us from the south and west from off the surface of the Atlantic, is charged with moisture. As it strikes against the precipitous hills of our western coasts, it is chilled by the colder land, and at the same time is driven upward by the conformation of the hills, and the result is that the moisture is deposited in the form of rain. Hence it follows that the southwest corner of Ireland and the western coast of England and Scotland are the wettest parts of the British Isles, and in great contrast to the eastern coasts.

The wettest parts of the globe are those where winds blowing from tropical seas strike against the chilled tops of high mountains, and probably there is no place with greater rainfall than the district which lies at the eastern extremity of the Himalayan Mountains, where the rainfall is said to amount to as much as four hundred inches a year.

Winds laden with moisture lose it at the first opportunity. Thus the southwest winds in this country cause heavy rainfalls on our western coasts, amounting to as much as one hundred and fifty inches per annum in some parts of Cumberland. The winds, thus dried by a fall of rain, can cause but little rainfall elsewhere, so that on our eastern coasts the rainfall is not more than twenty inches.

The centres of great continents are necessarily dry. The

middle of Australia, Sahara in the centre of Africa, and parts of Central Asia, are among the driest regions of the world.

What are the effects of moisture and dryness?

It is a well-known fact that when water is evaporated and turned into invisible vapor, that a certain amount of heat becomes latent, as it is termed, and cold results. When, on the other hand, watery vapor is condensed and becomes liquid, the latent heat is given out, and hence rain has a great power of warming the air. Professor Haughton has calculated that, on the west coast of Ireland, the heat derived from the rainfall is equal to half that derived from the sun.

The presence of rain-clouds has, of course, a great influence on the temperature of a district, as by obstructing the sun's rays they prevent the heating of the surface.

On the other hand, clouds equalize the temperature by preventing radiations of heat after sunset. Cloudless nights are cold nights, because of the comparatively unobstructed radiation. These are the nights when the gardener covers up his tender plants, and looks to his greenhouse fires. Cloudy nights, on the other hand, are warm.

Rainfall has a very purifying influence on the air, by washing it of its solid and some gaseous impurities. Who has not watched a thunder-shower after a spell of dry weather in London, in July or August? Previous to the shower the air is oppressive, and has a smoky, ammoniacal smell, and the wooden pavements, kept moistened by the watering-carts, smell like a stable. With the first drops of the shower, "blacks" as big as blue-bottle flies are driven downward from the upper strata; these diminish as the shower continues, and soon the air smells fresh and wholesome.

As to the effect of moisture upon health, not very much is known. Rainfall purifies the air, and if it be not sufficient to prevent exercise it apparently does no harm. When the air is hot and moist, so that evaporation, with its consequent cooling, cannot be effected on the skin, it is very oppressive. Moist air is most grateful to persons with dry chronic coughs.

There is one way in which moisture affects health, and which has been not much considered hitherto, and that is the effect it has on the process of decay and putrefaction. Putre-

faction, as is well known, is favored by warmth and moisture, and is checked by cold and dryness. Warmth and moisture for the most part favor the growth of bacteria and other allied micro-organisms, some of which are definitely known to be directly connected with epidemic disease, while cold and dryness check them.

Parkes ("Practical Hygiene," page 37) remarks:

"The spread of certain diseases is supposed to be intimately connected with the humidity of the air. Malarious diseases, it is said, never attain their fullest epidemic spread unless the humidity approaches saturation. Plague and small-pox are both checked by a very dry atmosphere. The cessation of bubo-plague in Upper Egypt after St. John's day has been considered to be more owing to the dryness than to the heat of the air.

"In the dry Harmattan wind on the west coast of Africa, small-pox cannot be inoculated, and it is well known with what difficulty cow-pox is kept up in very dry seasons in India."

If infective disease be due to organisms, and if the growth of these organisms depends upon conditions similar to those that regulate the activity of putrefaction and fermentation—facts in which there is a daily increasing belief—then we must come to the conclusion that dryness and cold both check one class of diseases; and that the biting, dry, east winds in this country, and the much-abused northwest wind which is known as the mistral in the south of France, are, although pitiless, and indeed often deadly to the sick and weakly, among our best friends from the point of view of health.

From the point of view of exercise and comfort, the absolute annual rainfall of a district is of less importance than the number of rainy days per annum. There is no necessary relationship between the annual rainfall and the number of rainy days; in fact, they often bear an inverse proportion to each other.

If we propose to visit a particular spot in search of out-door exercise, pleasure, and health, this point of the number of rainy days to be expected is one of very great importance. Thus, at Valentia, on the west coast of Ireland, with a very mild, even temperature, some 235 wet days per annum may be expected. According to Hassall, who is quoted by Weber,

there is at Torquay an average rainfall of 36 inches, with 200 rainy days; at Ventnor, 34 inches, with 174 rainy days; at Cannes, 35 inches, with only 70 rainy days; at Bournemouth, 28 inches, with 156 rainy days; and at San Remo, 28 inches, with only 48 rainy days.

Although I have no doubt these figures give a fairly correct notion of the relative raininess of the places mentioned, we must, nevertheless, be careful how we build our hopes upon average numbers. The average is sometimes calculated upon too small a number of years. Sometimes the years upon which the average is calculated are, so to say, picked, and the calculation, actuated by local bias, has begun with the year after and stopped short of a year when some extreme number has been reached. Even supposing that the averages are in every way just, we must still remember that there are extremes as well as means, and we may have the bad fortune to visit a spot with a dry reputation and get a daily drenching. Such was my luck at San Remo, in the month of February, 1883.

EVEN DIVISIONS OF CLIMATE BASED UPON COMBINED ATMOSPHERIC HUMIDITIES.*

By CHARLES DENISON, M.D.

DENVER, COL., June 27, 1885.

MR. EDITOR: As your journal contained quite a full report of the proceedings of our American Climatological Association (first two numbers for June), I crave permission to correct the mistakes which resulted from allowing my paper to be presented *in my absence*. Had I been able to be present, I should have endeavored to hold the discussion to the subject of my paper: "The Even Divisions of Climate Based upon the Combined Atmospheric Humidities," as illustrated upon my seasonal Climate-Maps of the United States. As there was an unwillingness to pass judgment upon these divisions (which, I believe, are the first of the kind ever presented to the medical profession), and as the discussion turned upon the therapeu-

* From The Boston Medical and Surgical Journal, July 9, 1885.

tics of climate, I assume the subdivisions as made on my charts, under the two heads *moisture* and *dryness*, were not objected to. Especially is this a fair conclusion, since the very important element of *soil-moisture* must have its appropriate influence everywhere (except for limited areas) upon the humidities of the air—relative and absolute humidity, and, in a less degree, cloudiness—and so upon the various coloring of the climatic maps. These charts give the general averages for the whole country, without reference to any particular frog-pond or region productive of soil-moisture. Therefore, as might be expected, those regions bordering on the oceans and lakes, or lying low in the interior, must naturally come out into the dark-blue shades of extreme moisture. If the Adirondacks and portions of the Alleghany range, rightly esteemed as health-resorts because of their sandy soil, free drainage, etc., are not properly represented on these charts, it is because there are no signal-stations there to indicate the shades of dryness to which those desirable localities belong.

Allow me to correct a statement in your report. You say: "Dr. Denison's view was that the principal elements of a desirable climate were dryness, elevation, and equability of temperature." That was not my idea at all, but may have been gathered from some statement made in the discussion of my paper. I would say that the chief elements of desirable climate for phthisical patients are dryness, coolness, sunshine, and elevation. With these qualities I am willing to accept a due amount of variability of temperature, which is their natural result, just as equability is synonymous with warmth and moisture of atmosphere.

The statement attributed to me in your journal is inconsistent with the following quotation from my last year's report to the Climatological Association: "Hitherto it has not been customary for climatologists to see any good in variability. They have rather preferred to champion its opposition—equability. It does not seem to have occurred to them that the qualities which they praised, such as clearness and purity of atmosphere—especially its freedom, with increasing elevation, from disease-germs and the evidences of the lower forms of life, which thrive on warmth, moisture, and equability—are largely due to the great seasonal and other ranges of tempera-

ture, and to the nightly chilling or perhaps freezing of the atmosphere. It is not necessary to introduce any argument of a speculative character. Statistics prove, beyond the possibility of successful contradiction, that variability is a distinguishing attribute of really dry places—whether elevated above sea-level or not—and that equability is, as a rule, characteristic of a uniformly damp atmosphere." In proof of this, the fifteen United States signal-stations giving the greatest mean daily range of temperature average 28.7° F., and are the really dry places, such as Yuma and Prescott, Ariz.; Visalia, Cal.; Forts Davis and Elliott, Tex.; and West Las Animas and Denver, Col.; while the fifteen stations of least daily range average 11.9°, and are uniformly moist places, such as Eastport, Me.; Buffalo, N. Y.; Barnegat and Sandy Hook, N. J.; Cedar Keys and Key West, Fla.; Hatteras, N. C.; Galveston, Tex.; and San Francisco, Cal. Still stronger evidence is obtained by averaging the daily and monthly ranges of temperature for all signal-stations as located in the different belts representing the divisions of climate on my seasonal climatic maps. The result is as follows:

Stations of	Means of Daily Ranges.	Means of Monthly Ranges.
	Fahr.	Fahr.
1. Extreme dryness	36.51°	53.65°
2. Moderate dryness	20.63°	49.38°
3. Moderate moisture	17.09°	45.48°
4. Extreme moisture	13.61°	41.55°

"The places of extreme dryness are more than twice as variable in daily temperature as those of extreme moisture, while the monthly means regularly decrease in variability at the rate of about 4° for each division of climate from the extreme of dryness to the extreme of moisture." I believe too much attention has hitherto been given to equability and the precise variations in temperature, and too little to other qualities and conditions of the atmosphere.

I was surprised to learn that any one who is so much of an authority on climatology as Dr. Bell, the able editor of THE

SANITARIAN, should bring forward the argument based upon the nearly equal proportion of deaths from consumption in Colorado and Florida, without even mentioning the importation into those States of the cases furnishing the mortality from this disease. In America, as in Europe, the migration of invalids, from causative to remedial climates, is becoming such an important factor in the treatment of chronic lung-diseases, that no census statistics are of any value without accounting for this effect. As to the origination of the disease in Colorado, I canvassed the physicians of the State several years ago, with decidedly confirmatory results in favor of an "approximate immunity from consumption" at six thousand feet above sea-level (*Rocky Mountain Health Resorts*, page 100). In my practice of twelve years in Colorado, it has been very seldom that I have known of the origination of phthisis here, and with the carefully kept records of nearly twelve hundred cases of asthma, phthisis, chronic pneumonia, etc., I do not remember to have written a certificate of death for one uncomplicated case of phthisis originating in Colorado. Of course, there are such cases; I have one under my care at the present time. As civilization progresses here, it will not be strange if the disease is much more frequently met with in thickly settled districts, made up as they are of a considerable scattering of regenerated invalids.

In Denver, physicians (in making out certificates of death) are requested to state where the disease was contracted. I learn from our Health Commissioner that for the year ending with May just passed, there were 151 deaths reported from chronic pneumonia, phthisis and consumption, and only eleven, including the chronic pneumonia cases, were reported as originating in Colorado, the information desired not being given in about half the cases.

In making comparisons between Florida and Colorado, it should be noted, also, that invalids go to Florida just *for the winter*, while they come here, from the South as well as the North, if possible, *to live;* that is, to fight it out to the end.

Finally, the weight of evidence is so decidedly in favor of elevation as an important factor in the climate for the consumptive, that it will not answer for any one, who has not personally investigated the Rocky Mountain regions or similar

elevated resorts, to say that nothing has been proved for elevation. Everything has been proved, since all the most desirable attributes—dryness, coolness, sunshine, stimulation of increased atmospheric electricity, sandy soil, and perfect drainage; and last, but not least, *purity of atmosphere*—are shown to be favored and increased with elevation above sea. Besides, and above all this, there are physical effects of the lessened atmospheric pressure, chiefly made known upon respiration and the pulmonary circulation of blood, which are remarkable for displacing diseased by healthy action—effects which are testified to by many who have personally investigated the subject at various elevations, and by such distinguished climatologists as Dr. Hermann Weber and Professor C. T. Williams, of London; Professor H. C. Lombard, of Geneva; Professor Jourdanet, of Paris, and lately by Professor Jaccoud.

WINE, BEER, OR SPIRITS.

A WELL-INFORMED correspondent, writing to us apropos of our remark in a recent article on the wine production of the world, that "the question which (wine or beer) will get the upper hand as a popular cheap drink in this country is still doubtful," calls our attention to some light thrown on this point by the Treasury statistics.

By reference to the reports of the Bureau of Statistics of the Treasury, it appears that the increase in the consumption of distilled spirits, wines, and malt liquors in the United States since 1840 is, taken by decades on a scale of 100, as follows:

	Distilled Spirits.	Wines.	Malt Liquors.
1840	100	100	100
1850	120	130	157
1860	209	227	435
1870	185	251	878
1880	148	581	1,777
1884	188	423	2,531
1881–2–3–4	176	492	2,266

The year 1880 being exceptional in the unusual amounts of domestic wine produced in the United States, as also in the unusual decrease in the production of distilled spirits, the average consumption for 1881–82–83–84, together with the statistics for 1884, is given.

To understand the above figures correctly, it may be necessary to explain that, *e.g.*, the amount of distilled spirits consumed in 1850 was twenty per cent. greater than in 1840, and in 1884 eighty-eight per cent. greater than in 1840. So, too, the amount of wine consumed in 1880 was five hundred and eighty-one per cent. of the amount consumed in 1840, etc., etc., etc. To get at the actual increase or decrease in the per capita consumption, comparison is to be made with the statistics of population since 1840, and we find that the increase of population by decades since 1840 is as follows:

1840	100
1850	136
1860	184
1870	226
1880	294

As will be seen, the population nearly trebled between 1840 and 1880.

If, now, we consider the actual number of gallons of each consumed at the successive decades, and for purposes of comparison estimate the population from 1881 to 1884, inclusive, at 52,000,000, we find the actual per capita consumption of distilled liquors, wines, and beer to have been as follows:

Gallons Consumed Per Capita.

	Distilled Spirits.	Wines.	Beer.
1840	2.52	.29	1.37
1850	2.23	.27	1.58
1860	2.86	.35	3.23
1870	2.07	.32	5.31
1880	1.24	.56	8.26
1881–2–3–4	1.46	.46	10.16

From the above it will be seen that the percentage of per capita consumption for the several decades is as follows:

	Distilled Spirits.	Wines.	Beer.
1840	100	100	100
1850	89	93	115
1860	114	121	236
1870	82	110	388
1880	49	193	603
1881–2–3–4	58	159	742

In other words, it clearly appears that during the past forty years there has been a decrease in the per capita consumption of distilled spirits of fully forty per cent., an increase of sixty per cent. in the per capita consumption of wines, and the enormous increase of six hundred and forty-two per cent. in the per capita consumption of beer and other malt liquors.

From these figures it would hardly appear a question of doubt as to whether wine or beer was to get the upper hand in this country. Whatever may have been the result from an economical point of view of this decrease in the use of distilled spirits, of which whiskey is the type, and in the great increase in the consumption of beer and of the light wines, there can be but little doubt that it has been beneficial to the general cause of temperance and good order in the community. It is also to be observed that the decrease in per capita consumption of distilled spirits does not accurately represent the rate of decrease which has taken place in their use for drinks, since doubtless a far larger amount is now used in the arts than formerly.

There is another point of importance in connection with this matter. By reference to the statistics it is found that the percentage of the total amount consumed of distilled spirits, wines, and malt liquors produced in this country has undergone a great change during the past forty years.

The following table of imported beverages represents the percentage of each consumed in the country for each decade:

	Distilled Spirits.	Wines.	Malt Liquors.
1840	6.2	97.4	.63
1850	9.8	96.5	.55
1860	6.7	83.2	1.11
1870	1.8	75.0	.49
1880	2.2	17.8	.24
1884	1.9	15.1	.34
1881–2–3–4	2.1	23.3	.31

It will be seen that only about two per cent. of the distilled spirits consumed in the United States is imported, while not over one-third of one per cent. of the malt liquors consumed is imported, and yet the amounts consumed are so great that even these small percentages amounted in 1884 to 1,511,680 gallons of distilled spirits and 2,010,908 gallons of malt liquors.

The statistics of the wine industry are of especial interest. It has been shown that the increase in the per capita consumption during forty years equals sixty per cent.; but, owing to the very rapid development of this industry in this country, the average importation during the last four years has been only twenty-three and three-tenths per cent. of the total consumption, while in 1840 it was ninety-seven and four-tenths per cent., and even so recently as 1870 equalled seventy-five per cent. The total importation of wines is to-day about the same as it was in 1840, notwithstanding the fact that our population has been trebled and that there has been an increase of sixty per cent. in the per capita consumption. In 1840 the amount of domestic wine produced was 124,734 gallons, and there was imported 4,748,362 gallons. During the last five years the average annual production has been 19,994,916 gallons, and the average importation 5,474,467 gallons. No one conversant with the present condition of the wine industry in our country can doubt that it has "come to stay," and the character of our domestic wines becomes a question of very great importance, the discussion of which must be reserved for a future occasion.—*The Nation.*

WHAT SHALL WE DRINK?

"Water, water everywhere,
And not a drop to drink."

THE more advanced people become, the higher their civilization, the nearer an approach is made to that perfection which is a guard against disease. Happiness and health go hand in hand. What chemical analysis and the microscope have done during the past few years in enlightening public sentiment,

really forming it, the slower-paced enactments of our law-makers have been obliged to follow. Chained to the car of progress, legislatures and health boards have been compelled to join the ranks, until in the near future let us hope will dawn an era of perfect health, fed by nourishing, wholesome food and pure drinks. It is not three years since the old pumps were pulled up in the streets of New York, and these well-springs of miasma and disease were left to dry up. The water was clear and cool which came from the spouts of these old stand-bys, and people thought it so good that they would carry their pitchers and pails for squares to get a draught. But chemical analysis said it was full of the germs of disease, and the microscope showed it to be a fact. Then the march of progress began, and has since extended to every large city in the United States. The water-supply in New York, both by chemical analysis and the microscope, has shown a greater degree of purity than is enjoyed by any other large city on the continent. The thorough investigation of the sources of this supply, and the publication of the results of analysis, have led other cities to submit what they are drinking to the same tests. Philadelphia has been sick at the stomach for over a year. Chicago feels bad in the same region, since it has been proven her water-supply comes from the lake inside the water-line marked by the discharging sewers. Newark drinks the Passaic flavored by Paterson sewage. The Potomac is the water-supply of several small cities before it reaches Washington. It also receives the sewage of those cities, and is about the consistency of circus lemonade or vegetable soup. A gentleman who has visited Great Falls, the point on the Potomac from which the water-supply of Washington is obtained, reports that there is a break in the canal just above where the aqueduct begins, and that the canal-water, carrying the refuse from privies, hog-pens, stables, and houses in the neighborhood, flows constantly into the pool which feeds the reservoir. A lock near this point effectually prevents the flowing off of this poisoned water. With the prevalence of warm weather this neglect may give Washington a taste of the experience of Plymouth. Recently there has been an awful plague at Plymouth, Pa. A report from the infected district showed that the whole number of cases in the borough since the epidemic

started was 905, with a total of 55 deaths. At present there are 134 convalescents in the town. The whole number of families in destitute circumstances is 246. An analysis of two jugs of water taken from the river and from a well, made by Professor Kedzi, showed that both the waters were unfit for either drinking or culinary purposes. The examination of this water awakens surprise, not that many are sick in Plymouth, but that any should be well.

In the Southern States the water-supply of large cities is even worse than at the North. Indeed, the water is regarded so generally bad and unfit for drinking that its general use is for cleansing purposes and for navigation. The Southern beverage is not water. The chemist and the microscopist have so tortured sensitive stomachs in this latitude with their revelations about water, that it is fast going out of use. Beer has largely replaced water as a drink in the larger cities, both because of its greater wholesomeness and purity, and because it is both food and drink. Mineral waters now find a place in the family ice-chest and upon the table.

What a field has opened up to the enterprising bottler? His goods are always in demand; and if their quality is invariably above suspicion, the trade will grow even as knowledge increases. Here's an old maxim, which, slightly altered, is suited to every bottler: "First, make your goods well, then make them easily; then make them quick."—*National Bottler.*

THE OLDEST EUROPEAN CITIES.—The oldest city in Europe is Argos, in Greece, founded about 1850 years before the Christian era. Next in order are Athens and Thebes, in Greece; Cadiz, in Spain; Cumæ, Syracuse, Locri, Rome, Crotona, in Italy; Saguntum, in Spain; Bysantium; and lastly, Marseilles, which was founded 580 B.C.—*Les Mondes*, September 27, 1884.

THE WHOLE TRUTH.—It is a well-settled rule of evidence, often laid down by the Hon. Noah Davis, that "every presumption must be indulged in against a party who deliberately suppresses evidence."

EDITOR'S TABLE.

THE INTERNATIONAL SANITARY CONFERENCE AND THE DANGER OF CHOLERA FROM INFECTED RAGS.

THE conference recently held at Rome was composed of diplomatic and technical delegates from Italy, Germany, Belgium, Spain, France, Russia, Servia, Sweden and Norway, England, Switzerland, Denmark, Turkey, Greece, Austria, India, Japan, Mexico, Brazil, several South American States, and the United States; and among the delegates there was a fair proportion of the foremost men in sanitary science—Koch, Moleschott, Brouardel, Proust, Thorne, Fayrer, Semmola, and Sternberg. Cholera was the chief subject of discussion. Among the most important declarations of the conference, in regard to it, is that "*land quarantines and sanitary cordons are useless.*" Besides this, and the adoption of the following excellent report of the Committee on Disinfection—of which Dr. Sternberg was a member, and believed to be a chief contributor—no other practical conclusions have been published:

"1. Steam at 100° C. (212° Fahr.) 2. Carbolic acid and chloride of lime. 3. Aëration.

Carbolic acid and chloride of lime are to be used in aqueous solutions. Weak Solutions: Carbolic acid, 2 per cent.; chloride of lime, 1 per cent. Strong Solutions: Carbolic acid, 5 per cent.; chloride of lime, 4 per cent.

These means of disinfection will be applied as follows:

I. For the disinfection of the person the weak solutions should be employed.

II. For the disinfection of clothing, bedding, and other articles of this kind: (*a*) destruction; (*b*) steam passed through the articles for one hour; (*c*) boiling for thirty minutes; (*d*) immersion for twenty-four hours in one of the weak disinfecting solutions; (*e*) aëration for three or four weeks, but only in case the other means recommended are inapplicable. Articles of leather, such as trunks, boots, etc., should be either destroyed or washed several times with one of the weak disinfecting solutions.

III. Vomited matters and the dejections of the sick should be mixed with one of the strong disinfecting solutions, in quantity equal to the amount of material to be disinfected. Linen, clothing, bedding, etc., recently soiled by the dejections of the sick, and which cannot be immediately subjected to the action of steam, should be at once immersed in one of the strong disinfecting solutions, and left for four hours.

IV. The dead should be enveloped in a sheet saturated with one of the strong disinfecting solutions, without previous washing, and at once placed in a coffin.

V. Disinfection of merchandise and of mails is unnecessary. *Steam under pressure is the only reliable agent for the disinfection of rags.*

VI. When cases of cholera occur upon a vessel at sea, the locality where the case occurs should be disinfected. The floors and walls of the cabin, or other locality, should be washed at least twice with one of the weak disinfecting solutions, and then exposed freely to fresh air. In the case of objects of considerable value, which have not been in immediate contact with the sick, and which would be seriously injured by a rigorous disinfection, the physician on board may determine what measures are necessary to protect the sanitary interests of the vessel. The bilge-water should be pumped out and replaced by sea-water, at least twice at each disinfection of a vessel. The closets should be well washed with one of the strong disinfecting solutions at least twice a day.

VII. If the drinking-water is open to suspicion, it should be boiled before it is used, and the boiling should be repeated, if it is not used, within twenty-four hours. All suspected food should be destroyed, or at least recently cooked.

VIII. Hospitals should be disinfected by washing the floors and walls with one of the weak disinfecting solutions, by a subsequent free ventilation and cleansing, and finally by repainting. The wards to be disinfected should, as far as possible, be isolated from those in use. The latrines should be disinfected at least twice a day, by pouring into them the strong disinfecting solutions, in quantity at least equal to the amount of the dejections received since the last disinfection.

IX. The clothing worn by physicians and attendants should remain in the hospital, and should be regularly disinfected.

Physicians and attendants should use the weak disinfecting solution for washing their hands, etc."

That the International Sanitary Conference should have come to the conclusion

That *steam under pressure is the only reliable agent for the disinfection of rags*, is surely no surprise to any diligent reader of THE SANITARIAN, for it is in accordance with its long-cherished faith:

That the most efficient of all disinfectants, wherever it is practicable, *is steam.*

The practicability of applying steam, at any desired degree of temperature, to rags, as indeed to nearly all articles liable to infection, and to infected vessels of every class, has been so abundantly and *efficiently* demonstrated as, it seems to us, to render any further argument for its universal adoption unnecessary.

But it *is necessary*, and high time that the public mind should be duly impressed with the truth in regard to the danger of rags, not only in relation with small-pox and cholera, but with other diseases.

And who is the observer, pray, that does not know that paper-stock rags gathered by the *chiffonniers* everywhere consist in great measure of the castaway clothing and bedding of those who have been sick with or died of infectious diseases? Of handkerchiefs loaded with expectoration, too filthy to wash, from the consumptive wards of hospitals; of bandages saturated with pus—often of the most loathsome diseases—from the surgical wards of hospitals; of the dirty-rag out-throw from lying-in and infant asylums, and other hospitals, asylums, and public institutions of every kind? And who, also, that has not seen the early *chiffonnier* before his own door, on ash-gathering day, with his hook and bag, pull out the discarded typhoidal dishcloths and other *kitchen* rags which no tidy cook can longer bear to handle without tongs? Who that reflects upon such common knowledge as this, by all except the purblind, can wonder at the most important fact of all in regard to rags, that they are a prolific means of spreading infectious diseases of every kind.

But with reference to rags gathered abroad, the out-throw of the cholera hospitals and of the panic-stricken inhabitants,

in infected places during the prevalence of an epidemic, the danger of spreading infection by this means is greatly multiplied.

The Boston Board of Health especially shows wisdom in not accepting the certificates of consuls in foreign ports as to the immunity of those localities from cholera, and in insisting, in cases where not satisfied with the thoroughness of disinfection said to have been made in foreign ports, upon a second disinfection by their own agents before allowing the cargo to land. This persistence of the Board is based upon abundant evidence as to the unreliability of some of the consular certificates and the inefficiency of the so-called disinfection (by burning sulphur), practised in most of the rag-exporting ports, and the uncleanliness of the vessels in which they are transported.

But the roundabout commerce in rags, as shown by the United States consular reports (below noticed), shows that the *last* port from which rags are shipped is no evidence of their cleanliness; and further, that while England prohibits the landing of infected rags at her ports, without seizure, she permits them to *take a new clearance from her own ports* for the United States or elsewhere! Is it possible that with a knowledge of such facts, port-health officers of the United States can longer hesitate to require that *all* imported rags shall undergo the process of thorough disinfection before they are admitted to pratique? Moreover, the disinfection should not be confined to the rags. The vessels in which the rags have been transported, and all vessels from places where cholera or any other infectious disease prevailed at the time of their departure, and all vessels in a filthy condition—above all those which are known to be traders in frequent communication with places commonly subject to cholera or yellow fever—should at all times be subject to prompt and efficient treatment, both as means of public safety and the promotion of commerce.

A case in point has occurred during the time of this writing (August 20).

A vessel from Cienfuegos arrived at the port of New York ten days ago, and after nine days' detention in quarantine, *without disinfection* (till the period of incubation was supposed to be passed, since any one on board had been exposed

at the port of departure or to any one sick with yellow fever on board), she was permitted to come up. But five days after she had been moored to the wharf one of her men was discovered in a lodging-house to have yellow fever, *contracted from the infected ship.*

Pray, why, in the interest of that sick man's life, the public health, and of commerce, was not that ship disinfected *within twenty four* hours from the time of her arrival, and turned over to her consignees, instead of being detained nine days and then sent on her way via New York, bearing disease and death?

Surely it cannot be said of her, as the paper-stock dealers of the rags claim, the process of disinfection was too expensive. Without any knowledge of what the expense would have been, with the very efficient process of applying steam which we recently described, and which we understand is now accessible afloat, it would not have cost the owners anything like as much as the nine-days' detention; would not have sacrificed a life; would not have involved the additional cost of renewed quarantine, and, we fear, final pratique without disinfection. Though of a totally different and far less dangerous disease to this community than cholera, this case should serve as warning. It illustrates what may occur any day under the present practice of allowing imported rags, and the filthy ships by which they are brought, to land, without efficient disinfection, at New York and other ports of entry.

As still further illustrating the danger of cholera, if disinfection is neglected, special attention is invited to the following official report of

Cholera in Europe in 1884: Reports from Consuls of the United States, published by the Department of State, according to act of Congress, giving an account of the origin, preventive and curative measures practised in the various ports and places where the disease prevailed, together with the quarantine and other regulations for its prevention in various other places.

This pamphlet (of 108 pages) contains a large amount of information which *port* health-officers, especially in the United States, should earnestly avail themselves of. From several of the letters of health inspectors and consular reports, *rags*

and *infectious diseases*, as articles of commerce, are well nigh synonymous terms, and should be treated accordingly. Dr. I. Higham Hill, Health Inspector of the London Consulate, under date of August 19, 1884, reports:

"I have heard that large quantities of continental rags are now being forwarded to America via Hull rather than via London, there being no United States health inspector at the former port. I cannot, of course, ascertain whether they contain the germs of infection or not, and the shippers are not always to be depended upon as evidence of their source. For instance, a certificate referring to twenty-three bales of rags which were shipped on board the steamship Lydian Monarch, which sailed for New York from London on the 17th inst., stating that these rags had not been collected in any infected district, but not naming the locality where they had been collected. On inquiry, I found that they came from Dunkirk, in France, where, according to to-day's papers, a case of Asiatic cholera has just occurred."

Consul Lathrop reports from Bristol, Eng., in reference to the disinfection of rags from France (during the prevalence of cholera) "rags landed from France must first be disinfected . . . . unless the rags are intended for immediate exportation, when no action need be taken. Under this provision it would be entirely competent for a vessel direct from Marseilles, for instance, to transship its cargo of rags at any English port for the United States. This cargo would then appear as a shipment from England, and would possibly be regarded with little or no suspicion."

Moreover, the *order* of the Local Government Board, under date of June 23, 1885, in relation to the same subject, is as follows:

"Article II. From and after the date of this order, and until the first day of November, 1885, no rags from Spain shall be delivered overside, *except for the purpose of export*, nor landed in any port or place in England or Wales.

"Article III. If any rags are delivered overside or landed in contravention of this order, they shall, *unless forthwith exported*, be destroyed by the person having control over the same, with such precautions as may be directed by the medical officer of health of the sanitary authority within whose

jurisdiction or district the same may be found."—(The italics are ours.)

In the light of such knowledge, it is clearly the duty of every port health-officer of the United States to require that *all* rags, no matter whence they come, and the vessels in which they arrive shall undergo the process of efficacious disinfection before admission to pratique.

NATIONAL, STATE, AND LOCAL BOARDS OF HEALTH REPORTS.

THE Annual Report of the National Board of Health for the year 1884 consists of a concise statement of the duties, powers, and work of the board from the time of its organization to the end of the year 1884; a copy of the bill introduced at the last session of Congress, and referred to the Committee on Public Health, providing for its continuance and support; a sketch of the five epidemics of cholera in the United States, 1832–1873, and measures deemed necessary for its prevention or prompt control in the event of another invasion; an estimate of the expenses necessary for the maintenance of the board, and an urgent appeal for such action by Congress and the President as will enable the board, in conjunction with State and local boards of health throughout the country, to ward off the now threatening danger of cholera.

"In this connection the attention of Congress is respectfully called to the fact that there is a large balance of appropriation, heretofore made for the National Board of Health, remaining unexpended on the books of the Treasury Department, which, in consequence of a provision in the act making appropriations for the sundry civil expenses of the Government for the fiscal year ending June 30, 1882, is not now available. It is recommended that this balance be made available for the purpose for which it was originally appropriated, and that in addition thereto a sufficient amount be appropriated to make the sum of $500,000 available for the purpose."

NATIONAL BOARD OF HEALTH,
July 28, 1885.

The following abstracts from consular reports just received at this office are furnished for your information. The board will hereafter receive reports regularly, and you will be fur-

nished promptly with all information received affecting the public health:

Place.	Week ending.	Yellow Fever. Cases.	Deaths.	Remarks.
Antigua, W. I	June 29th			No epidemic diseases reported.
Cienfuegos.....	Month June			
Cardenas	July 11th			
Cape Haytien	July 11th			
Curaçoa	July 11th			
Havana.....	July 16th	20	4	Typhoid fever prevalent.
Matanzas	July 15th			Typhoid fever, 1 death.
Nassau	July 18th			Intermittent and bilious fever.

Place.	Week ending.	Remarks.
Laguayra, Venez..	July 4th	No epidemic diseases reported.
Alicante, Spain ...	July 11th	Port and city healthy; cholera in province.
Lisbon, Portugal ..	July 9th	2 deaths from small-pox.
Paris, France	July 4th	43 cases of small-pox; 4 deaths.
Bordeaux, France .	July 11th	2 deaths from small-pox.

Cholera in Spain from March 4th, date of reappearance, to July 4th:

Province.	Cases.	Deaths.	Percentage of Mortality.
Alicante.....	1,588	646	40.6
Castellon.....	2,617	1,277	48.8
Cuenca.....	78	40	51.3
Madrid.....	1,700	753	59.2
Murcia.....	6,007	2,319	38.6
Tarragona	31	19	61.2
Teruel	12	5	41.6
Toledo.....	455	207	45.5
Valencia.....	14,728	6,851	45.5
Zaragoza	628	280	44.7
Totals.....	28,044	12,347	

August 12, 1885.

I have to transmit for your information the following abstract from consular reports received at this office since the date of our last bulletin :

Place.	Week ending.	Remarks.
Acapulco, Mexico ...	July 19th,	Free from epidemic disease.
Cape Haytien, Hayti.	July 25th,	Free from epidemic disease.
Cardenas, Cuba.....	July 25th,	Free from epidemic disease.
Laguayra, Venezuela.	July 25th,	Free from epidemic disease.
Callao, Peru	July 4th,	1 death from yellow fever, and 1 from small-pox. Fever reported as declining in the town. Small-pox prevailing very generally among the lower classes.
London, England....	July 20th,	118 cases of small-pox admitted to hospital during the week, 15 deaths reported. Total number of cases in hospital at end of the week, 792. Deaths from diarrhœa and dysentery, 210, and from simple cholera, 4.
Paris, France.....	July 25th,	No cholera or small-pox reported.
Nice, France.....	July 1–15th,	Free from small-pox and cholera.
Barcelona, Spain.....	By cable August 4th,	Consul reports cholera present but not officially declared.
Denia	July 28th,	Cholera officially declared; 3 to 6 deaths daily.
Gibraltar	Aug. 9th,	1 death from cholera at civil hospital.
Malaga	Aug. 7th,	Consul reported 4 cases of cholera. On the 11th, the civil authorities announced that the cases reported on 7th were not cholera.

Place.	Week ending.	Remarks.
Genoa, Italy.....	July 12th,	Free from epidemic diseases.
Venice	July 11th,	2 deaths from small-pox.
St. Petersburg	July 18th,	3 deaths from small-pox.

The presence of yellow fever at Vera Cruz, Mexico has been announced by telegram from the consul, but no further information has yet been received.

In the absence of a special appropriation for printing, we avail ourselves of the co-operation of the State Department to supply you with the enclosed report on the cholera in Europe in 1884. Other reports will be furnished as they are issued.

August 19, 1885.

Progress of cholera in Spain since last report, being for the period from July 4 to 17, inclusive:

Province.	Cases.	Deaths.	Percentage of Mortality.
Albacete.....	35	13	37.1
Alicante	2,083	856	41.1
Cartellon.....	1,367	639	46.7
Cuenca	467	205	43.9
Jaen	22	8	36.3
Madrid	1,076	602	55.9
Tarragona.....	369	184	47.8
Teruel	81	33	40.7
Toledo.....	608	267	43.9
Valencia.....	10,220	4,979	34.6
Zaragoza.....	1,690	585	34.6
Totals.....	20,897	9,499	
Previously reported..	28,044	12,347	
Grand totals.....	48,941	21,846	

W. P. DUNWOODY, *Secretary.*

ILLINOIS.—At the quarterly meeting of the board, held July 2–3, 1885, charges were preferred and action taken against several quacks, under the medical practice act. A few cases of small-pox were reported and prompt measures urged for preventing the spread of the disease. The secretary reported on the progress of cholera in Europe, gave a summary of

the proceedings of the recent Cholera Conference at Berlin, and of the International Sanitary Conference in Rome; the progress of sanitation in the State, by house-to-house inspection; an account of the typhoid epidemic at Plymouth, Pa.; of the new methods for the protection of the public health at the Mississippi Quarantine Station; and urged the importance of sanitary improvements in progress on the "South Fork" of the Chicago River. Dr. N. H. Paaren, State Veterinarian, gave a statement on the prevalence of glanders and farcy in animals, and the liability of the human subject to these diseases in a modified form. Health Commissioner, Dr. O. C. DeWolf being present by invitation, made a very interesting verbal statement of the work being prosecuted by him, and exhibited and explained the records, blanks, forms, regulations, etc., pertaining to the supervision exercised over buildings erected in the city of Chicago during the past three years. The sanitary history and condition of every building erected during that period are matters of record in the office of the Commissioner, for the inspection and information of intending purchasers or tenants. Dr. DeWolf stated that he had been enabled, by the increased appropriation, to more than double his force of house-to-house inspectors, and expected to substantially complete the inspection by August 1. During the past month 4,113 houses had been inspected in their regular order, and 535 through written complaints. As a result of these inspections, 4,171 notices to abate nuisances had been served, and of these 4,081 had been abated before the close of the month. The abatements include 2,914 privy vaults cleaned; 215 defective plumbing repaired; 176 plumbing traps applied; 15 water-closets ventilated; 290 drains repaired; 15 house-drains built; 457 yards cleaned; 185 catch-basins cleaned; 160 rooms lime-washed; and 157 miscellaneous.

MICHIGAN: *Good Health Results from Sanitary Work.*—Sanitary authorities have claimed that the sanitary work which they have recommended to be done as a preparation for cholera, such as preventing and abating nuisances; attending to drains, sewers, privies, and cesspools; cleaning up generally, and unusual carefulness in regard to foods and drinks, would reduce the sickness and deaths from other diseases,

even if cholera did not come. The weekly reports for July, 1885, to the Michigan State Board of Health, by physicians in different parts of the State, indicate that this claim is being realized in Michigan, so far as relates to the lessened sickness, it having been lessened from nearly every disease, and greatly lessened from fevers and from diarrhœal and other diseases believed to be especially influenced by sanitary conditions; and this is true notwithstanding that the meteorological conditions in that month were rather more than usually unfavorable to health. It is proper to state, however, that the sickness in any month is influenced by the meteorological conditions in the preceding month, and that the meteorological conditions in June, 1885, were favorable to health.

Observations in Michigan for many years have shown that in July the meteorological conditions especially unfavorable to health are high temperature, excessive humidity of the atmosphere, and deficiency of ozone. The "Bulletin of Health" in Michigan, July, 1885, says: "For the month of July, 1885, compared with the average of corresponding months for the seven years, 1879–1885, the temperature was slightly higher, the absolute and the relative humidity were more, and the day and night ozone were less."

"Compared with the average for the months of July in the seven years, 1879 to 1885, remittent fever, intermittent fever, dysentery, consumption of lungs, cholera infantum, diarrhœa, cholera morbus, measles, and whooping-cough, were less prevalent in July, 1885."

A large part of this decrease in sickness has undoubtedly been due to the medical and sanitary journals and the newspapers, which have constantly kept before the people the necessity for sanitary work, and the facts as to the spread of cholera in Europe.

It remains to be seen to what extent efforts for the exclusion of cholera from this country, and the general preparation for cholera by boards of health and the people, shall prove effectual; but even if cholera shall not be entirely prevented, there will remain the belief that the measures which have so greatly decreased the sickness from other diseases cannot but have had their influence in decreasing it; and if cholera does not occur in this country, it seems quite probable that, by rea-

son of the suffering elsewhere, there may be as many cases of serious sickness prevented in this country as there have been cases of cholera in Europe. But this may not continue without continued vigilance and effort.

HENRY B. BAKER, Secretary.

LANSING, MICH., August 12, 1885.

THE MISSOURI STATE BOARD OF HEALTH announces the appointment of committees to make special investigation as follows:

Prevailing diseases among live-stock in Missouri; also condition and care of stock-yards, cars, etc., at points of concentration or distribution—Committee: Mr. Gentry and Mr. Prather. The influential factors in the causation of endemic or local epidemic diseases—Committee: Dr. Griffith and Dr. Homan. The sources, quality, means of distribution, etc., of public water supplies in Missouri—Committee: Dr. Merrell and Dr. Cox. The sanitary care of railway and river transportation lines, including depots, landings, stations, wharf-boats, round-houses, and passenger and sleeping coaches—Committee: Dr. Homan and Mr. Gentry. Domestic and general sanitation in towns, villages, and country homes—Committee: Dr. Goben and Dr. Griffith. The condition of asylums, poor-houses, jails, workhouses, or other charitable or penal institutions, with reference to the health of the inmates—Committee: Mr. Prather and Dr. Merrell. The hygienic care of the school population and of public school buildings and premises—Committee: Dr. Cox and Dr. Goben.

NEW YORK.—TO THE EDITOR OF THE SANITARIAN: In the July issue of your journal you refer to the State Board as having prepared a "Bill" to meet a non-existent deficiency, which the Governor could not conscientiously sign. No such bill was prepared or introduced. The item in question was placed by the Ways and Means Committee in the general Supply Bill to supplement the "deficiency" in the appropriation. It was so placed in consequence of the statement in the accompanying report, a copy of which was transmitted to the Governor long before the Supply Bill was thought of, and Mr. Brooks personally explained to him, shortly before his veto of that item, what the deficiency meant. Therefore, the State

Board of Health is not responsible either for the wording of the item or for any misunderstanding of the purpose of the Governor.

ALFRED LUDLOW CARROLL, *Secretary.*

ALBANY, August 18, 1885.

Our statement referred to was based upon the Governor's own statement for not approving the measure, as published in the newspapers. That THE SANITARIAN does not stand alone in its understanding of the question is evident from the following from the *Brooklyn Eagle:*

The *Kingston Freeman* reinforces itself with weakness, when it relies on the trade journal called the *Sanitary Engineer*. Both papers seem to think that the Governor vetoed all the money that was available for the State Board of Health. Not so; he let it have the $20,000 it has yearly always had; then it had $8,000 more from unexpended balances. He vetoed a separate $20,000 item for "deficiencies" when the Controller informed him that there were no "deficiencies" whatever, but $28,000 available, $8,000 more than the sum annually needed. As to "crippling the Board," has the *Freeman* heard of any of the high-priced employés resigning? They have stopped blackguarding their betters at the command of the Commissioners, that's all. Dare the *Freeman* give these facts about the money to its readers?

RHODE ISLAND.—Seventh Annual Report for the year ending December 31, 1884, pp. 409.—This report comprehends the vital statistics for 1885, and a large amount of comparative information of preceding years since 1852. During the year 1883, there were recorded: Births, 7,046; still-born, 253; marriages, 2,611; divorces, 257; deaths, 5,282. The number of births in 1883 was considerably larger than in 1882, the number of still-born the same, the number of marriages less, the number of divorces less, and the number of decedents larger by about 200. The number of still-born, in proportion to the number of living births, was less than the average of previous years, that is, one still-birth in every twenty-nine of the whole number, in 1883, as against the average of one in every twenty-six and five-tenths for the previous years. The proportions of births and marriages to population, respectively, for 1883, were: One in every 39.2, and one in 52.9; of deaths 19.1 per 1,000; and of divorces, one to every 10.2 marriages.

Of the causes of death, thirteen principal causes are enumerated, giving percentages of the total from all causes, as follows: Consumption, 15.83; pneumonia and congestion of lungs 6.02; old age, 5.34; cholera infantum, 5.08; scarlatina, 4.34; dysentery and diarrhœa, 4.15; heart diseases, 3.90; fevers, 3.71; apoplexy and paralysis, 3.48; accidents, 3.08; diphtheria, 2.91; croup, 1.98. Of deaths from consumption in relation with nativity and parentage, the proportions were in every 10,000 of the living population of American parentage, 20.6; in every 10,000 of the living population of foreign parentage, 34.9.

Appended to the secretery's report, are the reports of numerous county and town correspondents, nearly all of which show increasing attention to sanitary improvement by their civil authorities throughout the State, and a gratifying result in a decreasing frequency of endemic and epidemic diseases. The report concludes, with an abstract of an elaborate report to the City Council of Providence, on Sewerage Systems and Sewage Disposal, by Samuel M. Gay, Civil Engineer, and Member of the State Board of Health, with special reference to improved sewerage for Providence.

TENNESSEE: Second Report of the State Board of Health, October, 1880—December, 1884, 8vo, pp. 615. This volume consists of the numerous reports and papers which have, for the most part, been noticed in THE SANITARIAN during the interval it covers, on the progress of practical sanitation in the State, together with the minutes of such other health organizations as this board has been in co-operation with for the promotion of national as well as State sanitation. But it is interesting, in this connection, to notice the summary of the increase of population, and the ratios of mortality, white and colored, in Memphis, 1880 to 1884.

1880: Population 34.000.—White, 17.229; colored, 16.707. Deaths, 1.054: white, 491; colored, 563. Per 1.000—white, 28.35; colored, 32.55: 31.

1881: 40.000.—White, 22,800; colored, 18.000. Deaths, 1.471: white, 30.22; colored, 44.77: 36.32.

1882: 46.014.—White, 28,273; colored, 17.741. Deaths, 1.121: white, 14.85; colored, 39.45: 24.36.

1883 : 62.335.—White, 40.207 ; colored, 22.128. Deaths, 1.403 : white, 15.19 ; colored, 38.83 : 22.50.

1884 : Populations given, the same as for 1883. Deaths, 1,677.—White, 766 ; colored, 921 : white, 18.80 ; colored, 41.66 : 26.90. Assuming the continued increase of the population in the same ratio, as for the preceding year, the ratios of mortality, as given, are in excess. It will be observed that the ratio of increase of population is greatly in favor of the white.

At the quarterly meeting of this board, July 2-3, Dr. G. B. Thornton submitted a special report on the new practice of maritime sanitation at the port of New Orleans, by which "hot air, the fumes of sulphur, bichloride of mercury, and an abundance of water, all applied by powerful machinery and pure fresh air, are the germicides relied upon. These agencies are applied in such quantities and length of time as is thought sufficient to answer the ends sought. We were informed officially that the same rules were applied at the Rigolette and Atchafalaya stations as were enforced at the Mississippi River station. . . . It is possible, in spite of all human agencies to the contrary, that yellow fever or cholera may be admitted into New Orleans, but an honest effort is being made by the health authorities there to prevent it, and if such should be unfortunately the case, it could not be justly charged to a want of integrity, but a want of ability to prevent it."

WISCONSIN. Eighth Report for the period from November 1, 1882, to September 30, 1884, being the first biennial report. This is a concise pamphlet of 160 pages, summarizing the most important work of the board, under a constraint which illustrates the small estimate placed upon its service by the legislature. "Under the provisions of the general law which was enacted soon after provision was made for biennial sessions of the legislature, which law prescribes the number and size of the reports of all State institutions, the size of the report of this board is limited to 150 pages, and the number of copies given it for distribution is only 500 biennially!"

Yet the law creating the board requires that it "shall diffuse among the people the information collected by it, and the functions of the board being chiefly advisory, it regards obedience to this requirement as being a very important part of its work ;" but it appears that until the recent biennial law,

there was a more liberal distribution of the publications of the board. It surely must have been an oversight of the legislature to have enacted such a limitation, for it is not possible to conceive of a legislative body with so little regard to the well-being of the people, as to have deliberately enacted such a prohibition. However, this is not the only evidence of the small estimate placed upon sanitary work in Wisconsin. "In too many places the health officer gets nothing; several towns pay the magnificent amount of five dollars per annum." Possibly if there was less willingness to do such service gratuitously, the public would place a higher estimate upon it, just as they do for the care of their cattle.

The special subjects investigated and reported upon are Consumption; "What Constitutes a Pure Milk?" "On the Conduct of Funeral Services in Death from Contagious Diseases;" and the Prevention of Cholera. Besides these stated subjects, there is an abstract of an extensive correspondence on the prevalence and the means of preventing typhoid fever, diphtheria, measles, scarlet fever, whooping cough, and other diseases, unfortunately very common through the ignorance of the people of the means of prevention, which a wide circulation of this excellent report would go far toward overcoming.

THE REGISTRAR-GENERAL'S ANNUAL REPORT of Births, Marriages, and Deaths registered in England and Wales during the year 1883 says:

Population estimated in middle of the year, 26,770,744.

Marriages, 206,384; 15.4 per 1,000 of population. Of the males who married during the year, 12.6 per cent., and of the females, 15.5 per cent. were unable to sign their names in the register. These percentages show considerable improvement over previous years. In 1843, 32.7 per cent. of the men, and 49 per cent. of the women; in 1853, 30.4 and 43.9; in 1863, 23.8 and 33.1; and in 1873, 18.8 and 25.4, respectively, were unable to sign the register. Births registered during the year, 890,722, 33.3 per 1,000 of population; but the lowest rate since 1853. Of these, 453,076 were males, and 437,646 females; or, 103.5 males to every 100 females. Of the whole number, one child in twenty was illegitimate.

Deaths registered during the year, 522,997, 19.5 per 1,000 of population. In the urban population the mortality rate was

20.8 per 1,000; in the rural population, 17.7 per 1,000. Both were considerably lower than the respective averages for ten preceding years.

The natural increase, or excess of births over deaths, for the year was 367,725. 1,826,487 names were added to the printed alphabetical indexes of births, marriages, and deaths, embracing a period of upward of forty-six years, and containing an aggregate number of 68,445,762 names. The number of searches in the records during the year amounted to 34,809.

IN IRELAND, during the three months ending with March last, in estimated population of 4,918,338, there were of births, 30,355—24.7 per 1,000; deaths, 26,918—21.9 per 1,000. The number of emigrants, during the three months, was 8,074, 1,181 less than during the corresponding period of 1884, and considerably below the average for the preceding ten years.

ONTARIO: "Third Annual Report" of the Provincial Board of Health, for 1884. This is a plethoric pamphlet of 224 pages, comprehending an account of a thoroughly organized system of sanitary work. "Since July 1st, of last year, there have been established in the Province 400 local boards of health, two-thirds of all the municipalities thus possessing local health organizations. In the total of 447 townships there are 184 boards. Of these 184 boards, 25 of them have appointed medical health officers, and 19 of them have appointed sanitary inspectors. Of the 203 cities, towns, and villages in Ontario, 180, or more than six-sevenths, have local boards of health." The Health Laws, Minutes of the Meetings of the Board, and the Reports of Local Boards are appended, giving in detail an account of the subjects in conflict with the public health investigated and acted upon, and the progress of sanitary work throughout the Province.

The report is lacking of a statistical summary of diseases and deaths, as a measure of results in comparison with other communities, which would materially add to its value.

BROOKLYN, N. Y., reports for the year 1884, 14,116 deaths in an estimated population of 644,526—an annual ratio of 21.19 per 1,000. In the last decade there have been but two years, 1878 and 1879, wherein the death-rate was lower, respectively 20.85 and 20.08 per 1,000. Of the causes of death,

consumption is especially remarked upon—1,913, or 66 more than in 1883, being by it. "The conviction is constantly growing among sanitary authorities that a certain proportion of cases of this disease are communicatable through diseased milk and meat, and that certain other cases arise from too close personal contact in families where the disease exists. As this conviction increases, the belief in the preventability of the disease will increase, and along with it will increase the demands upon boards of health to watch most carefully all suspicious supplies of tuberculous milk and flesh, and also to promote among the people a knowledge of the advantages of the isolation of the sick, of disinfection after death, and of a sanitary cleansing of all garments and utensils in use about consumptive patients, the avoidance of direct contact with their breath or any expectorated matter; patients that have lately recovered from measles are said to be especially susceptible to communicable phthisis. It is matter of popular knowledge that measles often 'runs into' phthisis." Three thousand seven hundred and forty-seven, or 26.5 per cent. of the deaths were caused by zymotic diseases, 83 more than in 1883, but in ratio to total number and population, less. There was a specially marked reduction in the number from scarlet fever, diphtheria, and croup, respectively, 218, 385, and 280, as against 505, 409, and 318. There was an increase of 857 in infant mortality, chiefly by diarrhœal diseases, over the previous year, attributed to a higher range of summer temperature. Typhoid fever about maintained its ground—107 deaths from it, against 92 in 1883, and from whooping cough there was a decided increase—222 against 132 in 1883.

Gratifying progress is reported in filling up wells, ponds, cesspools, and privy vaults, extension of sewers and water supply, and supervision of the food supply. The most troublesome subject at present engaging the attention of the Health Department is the gathering and disposal of garbage. In Brooklyn, as elsewhere, the lowest contract bid for this service always means as little labor as possible for the money. Public complaints have no effect whatever on garbage contractors. They are discounted at the outset, and every complaint that is satisfied in the progress of the work is supplanted by a new one, and so on to the end of the chapter. And such will

doubtless continue to be the case until public sentiment attaches more importance to the complete removal of garbage by cremation or some equally effectual measure, as one of the foremost conditions for the promotion of public health in all dense communities.

Surface filth throughout the city, is also a great and growing evil, and rendered worse by conversion into mud. Bad as dried horse manure and other filthy dust is, when whiffed about the streets, it is better so during hot weather, than to be converted into a putrefying compost. Sprinkling, to lay the dust in streets which are frequently swept, is salutary and adds to public comfort; but sprinkling as a substitute for sweeping, is a nuisance which should be abated.

HUDSON COUNTY, N. J., of which Jersey City may be considered the centre, comprehending a population estimated at 209,000, reports for the year 1884: Births (including 367 still-born), 4,475; marriages, 1,670; deaths, 4,905—23.3 per 1,000. 1,160 of the total number of deaths were caused by zymotic diseases, the chief of which were scarlet fever, typhoid fever, diphtheria, and diarrhœal diseases; 635, or about one-seventh of the whole number, were caused by consumption, and of acute lung diseases nearly as many more, showing a very large percentage of deaths due to preventable causes.

Of the several cities and towns comprehended:

Jersey City's death-rate was	24.3
Hoboken's death-rate was	20.6
Bayonne's death-rate was	16.4
Harrison's death-rate was	25.7
Union's death-rate was	25.3
Guttenberg's death-rate was	27.5
Hoboken Township's death-rate was	20.5
Bergen Township's death-rate was	47.5
Kearney Township's death-rate was	16.3
Union Township's death-rate was	23.1
Weehawken Township's death-rate was	22.0

SYRACUSE, N. Y.: First Annual Report for the year 1884. —This report opens with a carefully prepared paper by the health officer upon the necessity and results of vaccination and

revaccination in the public schools, by which it appears that out of 8,602 pupils registered in 1884, 8,163 were accepted, marked "V" in the register; 293 not accepted, and excused until the spring of 1885; 146 absent; average number of pupils entering every six months, 690. Including private schools and colleges: Students, 11,596; marked "V," 9,920; not marked "V," 1,676. Certificates of, or verified effective, vaccination are now required of all pupils.

Vital statistics recorded for the year as follows: Deaths, 1,022; births (including 94 still-born), 1,170; marriages, 475; burials in the city from abroad, 14. Births and marriages reported confessedly incomplete. Death-rate per 1,000 (estimated at 65,000), 15.7. The causes of death are not classified, and the registration in some respects unintelligible, for example: "Disease of lungs," 16; "phthisis," 10; "pneumonia," 19. "There have been no epidemic diseases," yet there were 36 deaths from diphtheria, 18 from cerebro-spinal meningitis, 12 from typhoid, and 14 from typhus, fever. Such statistics are suggestive of much room for improvement.

There are special supplementary reports on unwholesome meats, nuisances, food and water supplies, sewerage and the cleaning and ventilation of sewers, and disinfectants. Taken altogether this report is a good beginning of efficient health service.

WILMINGTON, Del.: "Reports of the President and Secretary of the Board of Health. Also, a Condensed Statement of Yearly Mortality for the Calendar Year ending December 31, 1884, inclusive, Submitted to the Board of Health. Edmund B. Frazer, Registrar."

In our July number, we took occasion to briefly notice this report, touching lightly upon the conditions which it suggests. At this, the registrar and secretary of the board, and the Wilmington newspapers have vented an amount of personal abuse upon the editor of THE SANITARIAN, which, had it been an outflow of material instead of foul-mouthed sewage, would have done good service toward purifying the soil of that city. As it is, some good results may be anticipated, for it cannot be otherwise than that, since the people of Wilmington have had their attention so positively called to this remarkable report, they will be interested in a more searching examination of it;

premising, however, that the allegations of the registrar of the Wilmington Board of Health and newspapers, that the editor of THE SANITARIAN has had, or now has any other interest in this exposure and criticism than the promotion of sanitation, is unqualifiedly and absolutely without foundation in fact.

The particular remarks in our previous notice, to which these gentlemen who claim a high standard of healthy conditions for Wilmington take exception are, that of the 1,190 deaths recorded in 1884,

> "More than half, as registered, were caused by zymotic diseases. . . . Wilmington has had a water supply many years without sewerage, and the soil is exceedingly filthy, giving rise to and promoting the great preponderance of zymotic diseases stated, and maintaining a condition of receptivity for infectious diseases of every kind scarcely equalled by any other city in the country."

Zymotic diseases are epidemic, endemic, contagious, or sporadic affections, communicable or inoculable, *capable of propagation from existing foci* or *preventable conditions;* hence they are also frequently and properly called preventable diseases; and in this sense they consist of all such diseases as malarial and typhoid fevers, diarrhœal complaints, pulmonary diseases, nervous affections of infants, small-pox and the like, and the contagious fevers of children.

Confessedly, in his communication to *Every Evening*, the Secretary sums up 341 deaths from zymotic diseases in Wilmington in 1884, a proportion of the total mortality, incomplete as it is, scarcely equalled by any city of equal population in the country. Just how he makes up this number from his unclassified and dubious category, does not appear, but it may be approximated by the following (using his own terms):

"Alcoholism, bilious remittent fever, chronic diarrhœa, child-bed fever, defective nutrition, intermittent fever, pernicious intermittent fever, malnutrition, *typus* cerebritis," of each 1—9.

"Croup, 38; cholera infantum, 85; diphtheria, 40; dysentery, 4; diarrhœa, 8; enteritis, 12; erysipelas, 13; scarlet fever, 23; typhoid fever, 45; typho-malarial fever, 10; malarial fever, 2; puerperal fever, 4; congestive fever, 2; measles,

4; meningitis (probably cerebro-spinal meningitis), 50; syphilis, 3; small-pox, 2; tonsi*le*tis, 2; typhoid pneumonia, 5; whooping-cough, 11"—363.

Deaths from tubercular diseases (including "consumption, 152; bronchitis, 5; hemorrhage of the lungs, 2; hœmoptysis, 1; catarrh, 9; tuberculosis, 9; tabes mesenterica, 2")—180. That fully one-half of these deaths from tubercular diseases were due to preventable causes, no one can doubt who is capable of estimating the extraordinary number, as compared with other places as favorably situated with regard to climate as Wilmington. One death in every 6.6, or upward of 15 per cent. of the total mortality from consumption shows Wilmington to be one of the worst conditioned places in the United States.

Of acute pulmonary diseases ("capillary bronchitis, 8; congestion of the lungs, 10; *colapsus pulmon*, 1; catarrhal pneumonia, 1; inflammation of the lungs, 1; pneumonia, 41; pleurisy, 7"), there were 69. The proportion of these due to the emanations from a foul soil through the houses, during the winter, especially, when the ground around is frozen, was doubtless equally as great as of consumption, and more than one-half due to preventable conditions. But there are still more remarkable figures. "Marasmus, 63"—the *wasting* disease, chiefly of children, and very commonly due to an impure milk supply, or poorly nourished mothers. Sixty-three deaths out of 1,190 from this cause is simply enormous. "Convulsions" (chiefly of infants, probably), "45," this number is scarcely less remarkable than of marasmus.

"Dropsy, 28; debility, 22; *general* debility, 26; old age, 26; exhaustion, 6; senile exhaustion, 2; natural causes, 26." Here are 136 deaths—diseases not named. How many of these were from preventable or criminal causes, is a matter of conjecture only, but it is at least safe to say more than two-thirds of them, excepting "dropsy," perhaps, which is oftener a symptom of alcoholism than of any other disease. The names by which the others are designated, are such as ordinarily occur among people who have not had physicians. Is there no responsibility attached to the registrar of vital statistics for not ascertaining the cause of death before giving permission for burial? Such a record implies that there may also be burials

without any report or registration whatever, and suggests that, besides a probably over-estimated population, the apparently small number of deaths in the aggregate, with so large a proportion from causes that are not named, is due to the fact that all of the deaths are not reported.

But the Registrar is not responsible for the *criminal* mortality—all preventable mortality is criminal—though he may be for not ascertaining it. Nor is he, indeed, for his deficient knowledge of the significance of the terms which he uses in designating the causes of death. Persons cannot reasonably be held responsible for practicing that which they have never learned. As a mere reporter, whether it be of the proceedings of a police court or of a board of health, an individual may be abundantly competent, but such knowledge is not equivalent to that which is required to make a qualified Registrar of Vital Statistics. On subjects within his sphere of knowledge the Registrar is clear and explicit. For example:

"There were reported to the Secretary of the Board of Health, during the year 1884, two hundred and seventeen privy-wells in violation of law, most of said wells being full, and a large number overflowing. They were all cleaned out by order of the Board of Health."

Now probably nobody in Wilmington knows better than Mr. Frazer that the ground which the city of Wilmington occupies is literally honeycombed with privy vaults and cesspools; that there are many of such filth-pits in the cellars; and many, too, in such proximity to the house-walls that an ordinance was passed some time ago prohibiting their being *within two feet* of the wall! And everybody, nowadays, who rightly pretends to sanitary knowledge, knows that a plenary water-supply without sewerage is a facile means of promoting soil saturation with filth. Yet Wilmington has had a conduit water-supply for three-fourths of a century; and this, after fouling by use, has been poured into the soil which is full to saturation. This is surely no news to the people of Wilmington, though the far greater proportion of them have been born since the system was there instituted. Some there are, we well know, who have learned to appreciate the constant depressing effect of this state of things upon the health of the

people, and who have learned by reading and observation that other places which have been beset by like causes and fatality, have been redeemed by sewerage and drainage of the soil; that the number of deaths from diseases herein denominated preventable, even when they have existed in less proportion than in Wilmington, have been reduced on an average one-half, and in many cases two-thirds, by sewerage and drainage. To know this, and not to practise it, is a crime.

As to the kind of sewerage and drainage best suited to Wilmington, she undoubtedly has a sufficient number of intelligent citizens capable of determining. *That* is the system which THE SANITARIAN is in favor of, and advocates for Wilmington, and no other.

THE AUXILIARY SANITARY ASSOCIATION OF NEW ORLEANS continues to be the most watchful organization of its kind in the United States. At the regular meeting of the Executive Committee, July 30, Mr. Edward Fenner, Chairman of the Flushing Committee, and Dr. Watkins, Sanitary Director, both urged prompt attention to the necessity of removing obstructions to the flow of flushing water in certain low-lying streets, by which the yards were made retaining pools of dirty soil-moisture dangerous to the occupants on such streets, and promotive of conditions favorable to the rise and spread of epidemic diseases.

Dr. Watkins reported that from general observation and from statistics in his possession there had been much improvement in the condition of premises, and that personal attention of householders is being paid to hygiene, which two or three years ago was thoughtlessly neglected. But he thought the Association should urgently protest against the obstructions to which reference had already been made, and their removal insisted upon by every enlightened citizen.

At the meeting, August 13, Dr. Watkins read from reports on the appearance of cholera in New Orleans in 1833 and several subsequent years. In each case of the appearance of cholera in this city it has been during the winter months. It was imperatively necessary that great vigilance must be exerted to place the city in a good condition. . . . He said that the people of New Orleans should congratulate themselves

on there being no longer any danger of yellow fever, the period being too late. While the people flatter themselves over the health, quarantine, etc., of the city, they should take an interest in placing the city in a cleanly condition for the not unexpected approach of cholera, which in the last six weeks has increased in Spain and France. The city should be clean in the event of the appearance of a case so as to prevent the spread of the disease.

COLORADO AND FLORIDA AS RESORTS FOR CONSUMPTIVES.—Dr. Denison, of Colorado, in his paper on other pages of this number, expresses surprise that Dr. Bell, before the recent meeting of the American Climatological Association (proceedings reported in July number), "should have brought forward the argument based upon the nearly equal proportion of deaths from consumption in Colorado and Florida, without even mentioning the importation into those States of the cases furnishing the mortality from this disease. . . .

"In making comparisons between Florida and Colorado, it should be noted, also, that invalids go to Florida just *for the winter*, while they come here, from the south as well as the north, if possible, *to live;* that is, to fight it out to the end."

Dr. Bell was by no means unmindful of Dr. Denison's researches in regard to Colorado, in this particular, at the time he made the remarks referred to; but he was equally mindful that the same claim is made in behalf of Florida, that the mortality from consumption in Florida, as in Colorada, is chiefly confined to those who go there with the hope of putting a stop to its progress—and so far as he has been able to ascertain from other sources, as well as from the special advocates of these two resorts respectively, the results are about as nearly equal as the mortality from consumption. It was no part of Dr. Bell's purpose to advocate either, as opposed to the other, but to illustrate by these examples that dryness is not the most important climatic element for the prevention or cure of consumption, and that moisture is not essentially injurious and promotive of it.

MORTALITY STATISTICS IN THE UNITED STATES.

MONTH OF JUNE, 1885. Correspondents under this head will please send reports promptly.	Total Deaths.	Deaths under 5 years.	Lung Diseases.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
Burlington, Vt., 13,300	26	13	10	1	..	..	..	1	..	1	25.4
Boston, Mass., 427,940	...	...	...	..	..	..	..	..	..	..	....
*Lowell, Mass., 68,500	68	14	21	..	..	..	..	3	..	6	12.6
†Worcester, Mass., 58,295	59	18	15	1	..	..	..	..	..	..	17.5
Providence, R. I., 120,000	158	44	53	1	1	2	1	4	..	2	15.8
New Haven, Ct., 78,000	99	34	23	5	..	18	2	2	..	7	15.2
New York, N. Y., 1,397,395	2,824	1,290	710	177	53	73	22	67	3	307	24.2
Brooklyn, N. Y., 665,602	1,275	675	288	51	33	25	10	21	..	304	22.8
Long Island City, N. Y., 21,000	...	...	...	..	..	..	..	..	..	..	....
Yonkers, N. Y., 22,000	31	17	4	..	1	..	..	3	..	6	16.9
Albany, N. Y., 95,000	154	65	32	11	1	13	2	4	..	8	19.4
Cohoes, N. Y., 20,000	24	7	6	2	..	..	..	1	..	..	14.4
Troy, N. Y., 60,000	81	19	20	2	..	..	..	7	..	2	16.2
Syracuse, N. Y., 65,000	51	17	13	..	1	..	1	1	..	2	9.4
Utica, N. Y., 39,000	43	7	13	1	..	1	..	..	..	1	13.2
Auburn, N. Y., 26,000	26	6	5	2	..	..	..	2	..	2	12.0
West Troy, N. Y., 13,000	16	5	2	..	..	..	..	2	..	..	14.7
Rochester, N. Y., 101,000	133	37	35	7	1	..	..	1	..	3	15.8
Kingston, N. Y., 20,000	29	15	7	4	..	1	1	1	..	1	7.4
Newburgh, N. Y., 20,000	27	11	7	1	..	1	..	..	..	3	16.0
Poughkeepsie, N. Y., 20,207	20	2	5	..	..	..	..	2	..	..	11.8
Oswego, N. Y., 24,000	24	4	5	..	..	..	..	4	..	..	12.0
‖Hudson Co., N. J., 213,000	92	32	30	3	5	..	2	2	..	..	22.4
Paterson, N. J., 57,000	96	38	18	2	1	..	..	6	..	..	21.0
§Philadelphia, Pa., 949,432	731	304	151	32	19	10	9	13	1	50	20.0
*Pittsburg, Pa., 180,000	256	113	61	14	7	2	1	6	..	..	17.0
Erie, Pa., 36,768	21	6	5	1	..	..	..	1	..	..	6.7
Wilmington, Del., 53,500	67	26	11	2	..	..	..	..	..	..	14.8
‖Cincinnati, O., 325,000	89	32	26	3	2	..	..	2	..	3	13.6
Toledo, O., 52,000	...	...	...	..	..	..	..	..	..	..	....
Detroit, Mich., 150,000	193	43	36	11	5	..	2	3	..	14	15.6
*Rock Island, Ill., 11,650	13	2	3	1	..	..	..	..	..	..	13.5
Chicago, Ill., 630,000	885	420	180	49	23	9	6	54	..	72	16.8
St. Louis, Mo., 400,000	644	328	116	23	14	6	2	43	..	101	19.3
Milwaukee, Wis., 160,000	219	60	37	24	2	3	1	2	..	5	16.3
San Francisco, Cal., 235,000	516	...	121	53	1	23	2	6	..	21	28.0
Minneapolis, Minn., 100,000	...	...	...	..	..	..	..	..	..	..	....
St. Paul, Minn., 100,000	76	32	15	4	..	..	..	3	..	2	9.1
Baltimore, Md., 408,520	575	258	108	11	6	1	3	9	..	85	18.2
Dist. of Columbia, 200,000	509	138	85	5	31	4	3	17	..	100	30.5
Richmond, Va., 73,400	187	79	33	..	1	..	..	11	..	..	29.8
*Lynchburg, Va., 23,000	48	23	11	..	..	..	1	..	..	4	26.2
Nashville, Tenn., 50,000	95	40	22	1	..	1	2	..	..	15	18.9
Mobile, Ala., 31,295	73	33	12	..	..	..	..	5	..	8	27.9
Savannah, Ga., 44,831	88	33	13	2	..	..	..	6	..	11	24.9
*New Orleans, La., 234,000	551	217	82	12	10	9	6	23	..	59	29.3

* 4 weeks; † 3 weeks; § 2 weeks; ‖ 1 week.

MORTALITY STATISTICS ABROAD.

FOR THE QUARTER YEAR ENDING JUNE 30, 1885.	Total Deaths.	Deaths under 1 year.	Bronchitis and Pneumonia.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Typhoid and Typhus Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
London, 4,083,928.....	19,675	4,436	3,335	466	138	1,186	662	142	420	336	19.2
Liverpool, 579,724.....	3,410	777	...	28	38	275	102	38	9	40	23.5
Glasgow, 517,941.....	3,375	716	726	38	47	178	152	34	2	64	26.5
Birmingham, 427,769...	2,120	557	...	7	5	24	67	7	..	33	19.9
Dublin, 353,082.....	2,643	399	429	28	46	158	44	57	2	45	29.9
Manchester, 337,342....	2,482	566	...	5	21	171	101	17	41	27	29.4
Leeds, 333,139.....	1,682	374	...	4	42	3	41	18	1	18	20.2
Sheffield, 305,716.....	1,711	413	...	2	14	138	88	18	5	20	22.3
Edinburgh, 246,708....	1,128	200	215	10	7	7	48	17	..	19	18.3
Belfast, 219,222.....	1,947	343	420	4	17	442	41	21	..	31	35.5
Bradford, 214,431.....	1,017	231	...	2	5	5	50	8	..	6	18.9
Hull, 168,292.....	843	199	...	4	4	2	11	5	7	17	20.0
Newcastle, 153,209.....	1,214	295	...	5	20	198	20	15	..	13	31.7
Havre, 105,867.....	805	172	111	25	3	15	13	17	..	53	30.4
Rheims, 93,833.....	634	156	85	13	..	...	16	16	2	86	26.0
Nancy, 76,858.....	496	105	33	4	3	34	20	17	..	21	25.9
Breslau, 295,000.....	2,464	957	232	21	8	2	28	20	..	273	33.3
Brussels, 175,811.....	973	242	171	32	9	11	6	11	..	120	22.1
Cologne, 153,500.....	1,186	343	128	10	7	62	22	4	..	93	30.8
Christiana, 126,000.....	665	134	85	96	38	...	10	2	2	33	21.1
Frankfort, 147,900.....	816	198	73	19	7	6	..	5	..	44	22.1
Hanover, 135,400.....	792	198	78	19	6	79	..	3	..	20	28.4
Bremen, 121,550.....	591	166	78	5	4	2	..	1	2	11	18.6
Dantzic, 119,240.....	770	292	73	40	18	...	..	4	..	85	25.8
Stuttgart, 110,918.....	620	211	66	22	1	...	..	4	..	48	22.3
Strasbourg, 110,739....	....	...	...	..	..	...	..	...	..	....	....
Dusseldorf, 110,033....	636	259	62	11	2	...	..	6	..	41	23.0
Nuremburg, 107,132....	700	238	119	34	..	1	..	8	..	96	26.1
Chemnitz, 106,163.....	897	424	36	23	6	...	..	4	1	20	33.8
Magdeburg, 109,000....	665	233	67	17	4	9	..	4	..	44	24.5
Elberfeld, 103,200.....	553	144	61	13	7	...	..	8	..	23	21.4
Barmen, 102,000.....	580	152	54	37	10	...	..	5	..	25	22.4
Altona, 98,550.....	707	209	116	23	7	1	..	7	..	31	28.7
Aix-la-Chapelle, 90,800.	599	204	65	1	1	...	..	4	..	23	26.5
Mayence, 65,000.....	398	110	61	7	11	2	..	2	..	36	24.5
Amsterdam, 361,314....	2,025	...	...	45	30	29	34	6	..	....	20.7
Rotterdam, 166,001....	918	...	...	8	22	1	9	5	..	11	22.1
The Hague, 134,552....	781	...	...	22	1	...	16	5	..	6	23.2
Lyons, 376,613.....	2,042	...	336	24	5	...	8	18	2	64	21.7
Berlin, 1,263,455.....	8,313	3,287	593	465	65	126	..	49	1	1,294	26.3
Hamburg, 497,956.....	3,224	930	420	150	38	17	25	35	..	163	25.9
Dresden, 241,500.....	1,469	427	148	79	34	...	..	10	..	90	24.3
Munich, 244,000.....	2,016	718	189	46	27	60	8	8	4	260	33.1
Leipzig, 168,976.....	965	366	64	46	11	32	..	6	1	71	22.9
Kœnigsburg, 157,660...	1,250	443	168	59	8	1	..	11	1	184	31.8
Bucharest, 200,000....	1,450	475	278	5	48	20	7	24	1	138	29.0
Paris, 2,239,928.....	13,899	2,048	1,530	418	47	571	73	214	49	899	20.4
Calcutta, 433,219.....	3,457	...	...	..	..	...	..	962	..	588§	31.9

§ Cholera.

VITAL STATISTICS OF IMMIGRATION.

NAMES OF STEAMERS, DATE OF ARRIVAL, PORT OF DEPARTURE, NUMBER OF PASSENGERS, NUMBER OF DEATHS AND BIRTHS DURING THE VOYAGE FROM EUROPEAN PORTS TO NEW YORK, FOR THE MONTH OF JULY, 1885.

Arrival.	Vessels.	From.	Passengers.	Deaths.	Births.
July 1,	Anchoria,	Glasgow,	385		1
" 1,	Westernland,	Antwerp,	744		1
" 4,	P. Caland,	Rotterdam,	280	1	
" 7,	Helvetia,	Liverpool,	365	1	1
" 9,	State of Alabama,	Glasgow,	167	1	
" 11,	Ems,	Bremen,	586		1
" 11,	General Werder,	"	607		1
" 17,	Main,	"	616	1	
" 22,	State of Penna.,	Glasgow,	184	1	1
" 22,	Bohemia,	Hamburg,	587	3	
" 24,	Wieland,	"	485		1
" 24,	Katie,	Stettin,	600	2	1
" 28,	Rugia,	Hamburg,	373		1
" 30,	Belgenland,	Antwerp,	316	1	1
			6,295	11	10

LITERARY NOTICES.

CHOLERA: Its Origin, History, Causation, Symptoms, Lesions, Prevention, and Treatment. By Alfred Stillé, M.D., LL.D., Professor Emeritus of the Theory and Practice of Medicine in the University of Pennsylvania. 12mo, pp. 164. Philadelphia: Lea Brothers & Co.

This is a timely book, giving the gist of the subject treated of from the standpoint of a careful and observant practitioner, rather than researcher and experimenter; hence it is not surprising that the author, though he believes that cholera is probably caused by a specific germ, does not accept the

bacilla doctrine of Koch nor the theory of Pettenkofer. He believes cholera to be contagious in the common-sense use of the word—communicable by the sick to the well—and cites many examples, which he considers conclusive, independent of drinking-water poisoned by the dejections, which, however, he considers the most common means by which the disease is spread; concurs in the common belief that fomites—articles of clothing, bedding, etc., from the sick—are dangerous means, and that rigid restrictions should be enforced for the prompt disinfection and destruction of the secretions, the disinfection of fomites of every kind, and a careful quarantine of the person. In regard to the origin of the disease, exclusively in India; its portability by commerce and travel; filth as a condition promoting but never originating it; and sanitation in its strictest sense as the best means of averting it, the work is alike unequivocal, terse, and comprehensive. Under the heads of pathology and treatment, all is said that need be on subjects of which much has been written, and all that is of value is brought to the surface, but nothing new added. As a concise review of cholera in all of its bearings, it is a clear presentation of all that is important, divested of redundancy.

HEALTHY FOUNDATIONS FOR HOUSES, with Illustrations. By Glen Brown, Architect, Associate American Institute of Architects. 16mo, pp. 143. This is a practical abstract of a great deal that has been written and said on an important subject, useful as a ready reference to all builders. New York: D. Van Nostrand.

STUDENTS' SONGS: Compiled and edited by William H. Hills. Pp. 60. Cambridge, Mass.: Moses King.

"Students' Songs" is a handsomely printed book, and contains sixty songs, with their music, nearly all of which are copyrighted, and to be found in no other collection. It is a surprise to find so choice a collection of new and copyrighted jolly songs and music selling for only fifty cents.

SANITARY SUGGESTIONS ON HOW TO DISINFECT OUR HOUSES. Prepared for popular perusal by B. W. Palmer, A.M., M.D. Detroit: George S. Davis; and

DISINFECTANTS: What they are good for, and How to use them in the Prevention of Contagious Diseases. Detroit: Parke, Davis & Co.

These are both valuable pamphlets, containing a catalogue of the most reliable disinfectants, with directions for their safe and efficacious use.

HINTS ON DIGESTION is a brief résumé of the latest physiological investigations with relation to the effects of *lactopeptine* as a remedial agent in the treatment of marasmus, cholera infantum, and other intestinal disorders to which children are particularly liable; vomiting in pregnancy, and dyspepsia. The New York Pharmacal Association, New York.

PUBLICATIONS RECEIVED.

Shadows in the Ethics of the International Medical Congress. By Levi Cooper Lane, A.M., M.D., etc.

Voice in Singers. By Carl H. Von Klein, A.M., M.D.

Congrès International de Botanique et d'Horticulture d'Anvers (1885). Rapport de M. Charles Joly.

Hydatid Tumors in the Brain. By R. Harvey Reed, M.D.

Influence of Sea-voyaging upon the Genito-Uterine Functions. By I. A. Irwin, M.A., M.D., etc.

Constitutional Treatment of Caries and Necrosis. By Hal C. Wyman, M.D.

Stories from the Biological Laboratory. Johns Hopkins University. Vol. III., No. 3.

Sanitary Review of the Session of the Association of Public Sanitary Inspectors, May 2, 1885. By Edwin Chadwick, Esq., C.B.

Annual Address before the Medical Society of West Virginia. By George Baird, M.D., President.

Suersen's Obturators; their Construction and Uses. By Dr. Th. Weber.

Catalepsy in a Child Three Years Old. By A. Jacobi, M.D.

Twenty-fourth Annual Report of the Cincinnati Hospital, 1884.

Electricity as a Remedial Agent. By George C. Pitzer, M.D., etc.

Vitiligo. By R. Harvey Reed, M.D.

Surgical Notes from the Case Book of a General Practitioner. By William C. Wile, M.D., etc.

THE SANITARIAN.

SEPTEMBER, 1885.

NUMBER 190.

RULES FOR THE HYGIENIC TREATMENT OF PULMONARY CONSUMPTION.

By BENJAMIN WARD RICHARDSON, M.D., LL.D., F.R.S., Etc.

RULE I.—*A supply of pure air for respiration is the first indication in the treatment of the consumptive patient.*

In large cities, and even in small towns, it is next to impossible to get a constant supply of pure air in inhabited houses, for houses are built according to false notions of comfort. "What a nice, cosey room!" is a common expression, applied innocently to every place where the greatest care has been taken to make an air-vault without a "draught," and all ready for being charged with invisible impurities.

In a cosey room the consumptive is bound never to live, nor, indeed, in any one room for great lengths of time. So long as he is able to be out of doors, he is in his best and safest home. In the fields, on the hills, wherever the fresh air vivifies, where plants look most vigorous, and animals frisk about in the joy of health, there will the consumptive draw in his choicest medicine, there meet most advantageously the dangers of his disease, and there repair most easily the waste of tissue.

The inclemencies of the weather may temporarily, it is true, prevent the patient from his out-door existence. But

even these inclemencies are not so much to be dreaded as confinement in a house. I have had occasion repeatedly to remark, that if from a few days' rain the consumptives under my care were confined to their homes, instead of being able to take the daily out-door breathing invariably prescribed under such circumstances, the aggravation of symptoms was always marked and universal. The appetite fell off, the debility became greater, the mind was less buoyant, the local mischief increased. The patients, too, previously accustomed to a full dose of the air-food, were not ignorant of the cause of these changes, for reduction in air is felt as quickly as reduction in common diet. Seeing these evils, then, I have long since thrown off the alarm about bad weather, and have ordered every patient to seize, even in an inclement day, each gleam of sunshine, for the purpose of getting out for a breath of fresh air. The result of this practice has been most gratifying in all cases where the courage of the patient has admitted of its application.

As much of the day, then, as is possible, should be spent by the consumptive in the open air, and in places where the air is least impeded and least corrupted. When he is compelled to keep the house, the necessary precautions must again be taken for procuring a free admission of the atmosphere. No cosey room with a temperature of 70°, with every crevice closed, and with an atmosphere in a dead calm and laden with impurities, should be permitted. But the temperature should be 60° Fahrenheit; the fire, if there be one, should be in an open grate; and by a free chimney vent, secured by an Arnott valve, the freest possible current of air should be kept circulating through the room. If the patient is cold, let him approach the fire, but let him not labor under the popular and fatal error, that the way to obtain animal warmth is to shut out the air and roast the body. The heat of the body is made in the body itself, by virtue mainly of the oxygen supplied in the air; and as the body absorbs external heat with great difficulty, it would be as wise to attempt to give warmth by fires, hot bottles, and hot air, to a man who is not inhaling a due amount of oxygen, as to attempt the same process on a marble statue. In a word, external heat is useful only in preventing the too rapid radiation of animal heat from the surface of

the animal body. Alone, it cannot supply heat; but when a wholesome air is inspired, it can secure the retention of the heat that is developed in the animal furnace.

I spoke a moment ago of the open fire-grate. This is an essential for the room of the consumptive. Stoves of all kinds, heated pipes, and, in a word, all modes of supplying artificial warmth, except that by the radiation from an open fire, are, according to the facts which I have been able to collect, injurious. They are injurious because by their means the air is made too dry, an objection much less applicable to the open fire.

The bedroom should be large, unencumbered by needless furniture, and thoroughly ventilated. If the temperature of the air without is not below 60° Fahrenheit, the windows of the room should be boldly set open, and be kept open at the top all night. If they are to be closed of necessity, a free chimney draught must be procured. Warmth of body is best secured by woollen bedclothes; but if the temperature of the air is below 60°, it will, with advantage, be raised to that pitch by a fire in the open grate. Gas should on no pretence be burned through the night in this bedroom, and as few other lights as possible, for the patient requires all the air that is to be had, and must not be carelessly robbed of it. *Above all things, the consumptive person should be the sole occupant of his own bed and bedroom. To place such an one for several hours close to another person, however healthy, is injurious to both, but especially to the sick. No ties of relationship, and no mistaken kindness, should cause this rule of isolation ever to be broken.*

RULE II.—*Active exercise is an essential element in the treatment of consumptives.*

The conditions for obtaining a due supply of air imply in some measure the necessity for exercise. But there are varieties of exercise. Drs. Rush, Jackson, and Parrish are in favor of riding on horseback; but this is a thing not practically to be carried out in the majority of cases, and, as I think, not absolutely necessary. Walking is the more natural exercise; it brings into movement every part of the body, more or less, and, leading to brisker circulation in every part, causes a more active nutrition generally. Of late years I have very much

recommended tricycling to consumptive patients, and often with great benefit. In many instances it is better than walking exercise, giving more perfect change of air and scene with less fatigue.

If, in his waking hours, the consumptive patient can keep himself occupied pretty freely in muscular labor, he secures the best sudorific for his sleeping hours that can possibly be supplied; for as the force of life is always expended in producing motion or action, so, to use the words of Dr. Metcalfe, "the proximate cause of sleep is an expenditure of the substance and vital energy of the brain, nerves, and voluntary muscles beyond what they receive when awake; and the specific office of sleep is the restoration of what has been wasted by exercise." Cough is very much less frequent in the course of the night in him who has been subjected to exercise in the day; while sleep, when it falls, is more profound, more prolonged, and more refreshing.

In summer time, when the temperature of the day is high, the morning and the evening time are the best adapted for the periods of out-door exertion. In the other seasons, midday is preferable, as a general rule.

RULE III.—*An uniform climate is an important element in the treatment of consumptives.*

Consumptive patients are constantly asking questions as to the value of a change of climate. The poorest applicants for relief are anxious on this point, and are often ready at once to contemplate emigration, if the merest hope is given to them that such a course would prove beneficial. In considering climate, the fact should be remembered that the main point to be obtained is to select such a part of the earth's surface as presents the nearest approach to an *equality* of temperature. Different writers of eminence have given the most contrary opinions on climate and consumption. Some have recommended a warm climate, others the polar regions.

I shall recommend no particular place as a resort for consumptives; for I wish not to enter into disputation on this point. But here is the formula for an hypothetical Atlantis for consumptives. It should be near the sea-coast, and sheltered from easterly winds; the soil should be dry; the drinking water pure; the mean temperarure about 60°, with a range

of not more than ten or fifteen degrees on either side. It is not easy to fix any degree of humidity; but extremes of dryness or of moisture are alike injurious. It is of importance, in selecting a locality, that the scenery should be enticing, so that the patient may be the more encouraged to spend his time out of doors, in walking or riding exercise. A town where the residences are isolated and scattered about, and where drainage and cleanliness are attended to, is much preferable to one where the houses are closely packed, however small its population may be.

RULE IV.—*The dress of the consumptive patient should be adapted to equalize the temperature of the body, and so loose that it interferes in no way with the animal functions.*

For the consumptive, flannel clothing is always required, and it should cover the whole of the body. The thickness of flannel must vary according to the sensations; as far as is possible, the feeling of absolute cold ought to be at all times prevented. The consumptive should sleep also in flannel; not in the dress worn during the day, but in a flannel gown. The shoes worn should be lined with flannel.

RULE V.—*The hours of rest of the consumptive patient should be regulated mainly by the absence of the sun.*

If exercise is important to the consumptive patient during the day, a due allowance of sleep is necessary during the night. The natural hours of sleep are from sunset to sunrise, and it is the business of the consumptive to make nature his oracle.

Thus, to fulfil the natural law regulating the times of sleep, to escape from the artificial light, and to obtain the advantage of all the sunlight that can be secured, the consumptive patient should make the sun his fellow-workman.

RULE VI.—*The occupation of the consumptive patient should be suspended if it is in-door or sedentary; but a certain amount of out-door occupation may be advantageous.*

This rule is often difficult to carry out. At the same time it is second to none in importance, as there is, in a word, no exciting cause of consumption so general as in-door occupation.

I remember a patient once who, in the first stage of consumption, insisted on coming into town each morning, from a

considerable distance in the country, to look after his business, and to return home again in the afternoon. It mattered not that the sky looked threatening, for he was not afraid of such a trifle, although he thoroughly knew his critical condition. When expostulated with by his advisers (and, I am ashamed to say, by myself, for I was ignorant then of the truths I now state), his reply was: "My brothers and sisters have all died of consumption; they were coddled up, nursed, carried about, confined to bed, and bound in the cords of helplessness, by the kindest hands, to the satisfaction of the doctor and of all concerned. But they soon died. I inherit the proclivity to the same disease, and I too shall die; I know it; but my course is different, for I have made up my mind to die in harness; I have kept at my business, in resistance to all entreaties, and I am the only one of the family left." The plan adopted by this man was right; he bore the brunt of the disease for months, and is alive and occupied still.

RULE VII.—*Excessive mental exertion should be avoided by the consumptive.*

I have seen so much mischief arise from the overwork of the mind, in consumptive children and youths, that I have dwelt no longer than is really necessary in treating on the importance of the present rule. If I had a child of decidedly consumptive tendency, he should scarcely touch books at all. He should be taught orally as much as possible; he should be brought up in the open air, and to out-door pursuits and occupations; and he should be encouraged to enter into every innocent game where the muscles are brought into vigorous play.

RULE VIII.—*Cleanliness of body is a special point in the treatment of consumption.*

But little need be said to enforce this rule. In health there is always a mutual understanding and a kind of partnership between the skin and lungs. In consumption moderate action of the skin is a relief to the lungs, and as such ought to be encouraged. This is best attained by keeping the skin clean by daily ablution. Let the consumptive boldly take his bath, as each morning comes; not a shower-bath, not a cold bath, under any impression that water cast on the body in a certain fashion, or at a certain temperature, will give strength, but a

tepid, cleansing bath, with the temperature from five to ten degrees below that of the body. There is no occasion to stay in the bath a moment longer than to obtain a free ablution; then the patient should rapidly but effectually dry himself all over with a rough towel, and dress with the flannel garment undermost.

The clothes of the patient should be scrupulously clean; the under-clothing should be changed every day.

RULE IX.—*Abstinence from all habits of gross sensual indulgence is an essential part, both in the prevention and the cure of consumption.*

I need not particularize the vicious sensual indulgences to which many of human kind habituate themselves; for as suggestive descriptions are better left unwritten for those who are ignorant of sensual indulgences, so for them who require to be forewarned no such descriptions are demanded, since they know too much already. In a word, I should say that the grosser the sensuality indulged in, the greater is the physical evil resulting from it. Let the consumptives, at least, bethink themselves what vices affect and prostrate most, and then with strong mind and will give them up altogether.

To those who have charge of the young, no duty is so imperative as that of carefully watching over the physical interests. Let these make it their first care to prevent the tendency to sensual debasement. In large schools, a little attention and firmness on the part of teachers and governors, with the assistance of medical supervision, would obviate a host of life-long evils.

RULE X.—*The diet of consumptive patients should be ample, and should contain a larger proportion of the respiratory constituents of food than is required in health.*

The quantity of food taken by the consumptive person should be small at each meal; but the meals may, if the sensations of the patient require it, be more frequent than in health. Of animal foods, mutton is the best. Fatty and oily foods, which constitute the respiratory class, should predominate, and fresh butter, with bread, may be taken almost *ad libitum*, so long as it agrees with the stomach. Cream, too, is excellent, and the luxury of curds and cream is very suitable. Milk, whenever it suits, is advisable as a constant drink-

food, and good cows' milk, new, answers every purpose. There are, as far as I can gather from numerous cases in which I have seen them tried, no specific virtues in asses' milk and goats' milk, as some have supposed. Tea may be taken, in moderation, with perfect safety. Fresh vegetable diets should not be omitted; and fruits, especially roasted apples, are always admissible, except in instances where they excite irregular action of the bowels. The Iceland moss has had a great reputation, as have jellies of different kinds, but these often are slow in digestion, and have no specific value.

The question of the use of alcohol in consumption is one on which scientific opinion is much divided. I have recommended alcohol under some conditions of the disease, and I have shown, on the other hand, that one particular kind of consumption may be produced by indulgence in alcohol. Of late years I have prescribed alcohol very sparingly, and never in the form of pernicious mixtures in which it is sold for general use under the names and forms of alcoholic beverages. When I now prescribe it, it is purely as a medicine and in the form of alcohol itself, properly measured, properly diluted, and properly timed. In this form it comes under the head of medicinal, as distinguished from hygienic, treatment, and, I am satisfied, with much more value than when it is inaccurately classified as a food or drink.

The two indulgences of snuff-taking and tobacco-chewing ought to be strictly avoided by the consumptive.

Reviewing what has been thus written, I would add, as a supplement to the ten rules submitted, that whenever distinct evidences of phthisis have set in in an individual of either sex, the marriage of such person is wrong, if not inexcusable; while the marriage of two persons, both the victims to the disease, is opposed both to reason and humanity.

CONCLUDING NOTE.—The above essay "On the Hygienic Treatment of Pulmonary Consumption," less one or two minor revisions, was written and published under the same title in 1856. The essay found little favor. It was considered as not practical, and as conveying the ideas of a dreamer, that the fatal disease, consumption, could be prevented generally and treated specially by hygienic measures. To-day, under a revival of the old animalcular speculation as to the origin of

some diseases from living forms—the entity doctrine in a new dress—the conception of the hygienic treatment of pulmonary consumption has been accepted in name as well as practice, as if it were new in word and deed, the height of practical learning and skill. So ideas change; and the disfavored of one generation is the favored of another. But it matters not how or by whom it is borne, so long as the torchlight of truth makes its way.—*Asclepiad.*

"AN YPSILANTI MAN," says the Lansing *Republican*, considers the recent sanitary convention in that place a humbug of the biggest kind, and declares that "what was good enough for *our* grandfathers is good enough for *us.*"

It is surprising that the *Republican* has not taken some pains to discover who *that man* really is, and who *his* grandfathers were, instead of for a single moment considering that either he or they are in any way related to the present generation of mankind. By what construction of syntax, in the first place, he presumes to consider himself an *us*, instead of an ass; or that *his* grandfathers were, or are, in any way related to the Lansing *Republican*, or to any person who reads newspapers, is beyond question. If he indeed be a man, which is not to be taken for granted because he looks like one, he deserves pity and should be looked after. It may not have been his fault that he was born at a time and in a place so circumscribed and malodorous as to render him oblivious to a change of scene. THE SANITARIAN, at least, does not believe that because a person may have happened to have been born in a pig-sty he is necessarily a hog, and therefore insensible to conditions adapted to human beings endowed with intelligence superior to pigs. This is an age of improvement, and if there is a man in Ypsilanti who has not yet perceived it, he should be sent to Sunday-school.

DIET IN RELATION TO AGE AND ACTIVITY.

By Sir Henry Thompson.

ENOUGH, and more than enough, perhaps, has been uttered concerning the prejudicial effects on the body of habitually using alcoholic beverages. It is rare now to find anyone well acquainted with human physiology, and capable of observing and appreciating the ordinary wants and usages of life around him, who does not believe that, with few exceptions, men and women are healthier and stronger, physically, intellectually, and morally, without such drinks than with them. And confessedly there is little or nothing new to be said respecting a conclusion which has been so thoroughly investigated, discussed, and tested by experience as this. It is useless, and indeed impolitic, in the well-intentioned effort to arouse public attention to the subject, to make exaggerated statements in relation thereto. But the important truth has still to be preached, repeated, and freshly illustrated, when possible, in every quarter of society, because a very natural bias of self-indulgence is always present to obscure men's views of those things which gratify it; while, in addition to this, an exceedingly clever commercial interest of enormous influence and proportions never ceases to vaunt its power to provide us with "the soundest," "purest," and—most to be suspected of all—with even "medically certified," forms of spirit, wine, and beer, apparently rendering alcoholic products conformable to the requirements of some physiological law supposed to demand their employment, and thus insinuating the semblance of a proof that they are generally valuable, or at least harmless, as an accompaniment of food at our daily meals.

It is not, however, with the evils of "drink" that I propose to deal here: they are thus alluded to because, in making a few observations on the kindred subject of food, I desire to commence with a remark on the comparison, so far as that is possible, between the deleterious effects on the body of er-

roneous views and practice in regard of drinking and in regard of eating respectively.

I have for some years past been compelled, by facts which are constantly coming before me, to accept the conclusion that more mischief in the form of actual disease, of impaired vigor, and of shortened life, accrues to civilized man, so far as I have observed in our own country and throughout western and central Europe, from erroneous habits in eating than from the habitual use of alcoholic drink, considerable as I know the evil of that to be. I am not sure that a similar comparison might not be made between the respective influence of those agencies in regard of moral evil also; but I have no desire to indulge in speculative assertion, and suspect that an accurate conclusion on this subject may be beyond our reach at present.

It was the perception, during many years of opportunity to observe, of the extreme indifference manifested by the general public to any study of food, and want of acquaintance with its uses and value, together with a growing sense on my own part of the vast importance of diet to the healthy as well as to the sick, which led me, in the year 1879, to write two articles in this review, entitled "Food and Feeding." And since that date fresh experience has, I confess, still enhanced my estimate of the value of such knowledge, which indeed it is impossible to exaggerate, when regarding that one object of existence which I suppose all persons desire to attain, viz., an ample duration of time for enjoying the healthy exercise of bodily and mental function. Few would, I presume, consider length of life a boon apart from the possession of fairly good health; but this latter being granted, the desire for a prolonged term of existence appears to be almost universal.

I have come to the conclusion that a proportion amounting at least to more than one-half of the disease which embitters the middle and latter part of life among the middle and upper classes of the population is due to avoidable errors in diet. Further, while such disease renders so much of life for many disappointing, unhappy, and profitless—a term of painful endurance—for not a few it shortens life considerably. It would not be a difficult task—and its results, if displayed here, would be striking—to adduce in support of these views a numerical statement, showing causes which prematurely terminate life

among the classes referred to in this country, based upon the registrar-general's reports, or by consulting the records of life-assurance experience. I shall not avail myself of these materials in this place, although it would be right to do so in the columns of a medical journal. My object here is to call the attention of the public to certain facts about diet which are insufficiently known, and therefore inadequately appreciated. And I shall assume that ample warrant for the observations made here is within my reach, and can be made available if required.

At the outset of the few and brief remarks which the space at my disposal permits me to make, I shall intimate, speaking in general terms, that I have no sympathy with any dietary system which excludes the present generally recognized sources and varieties of food. It is possible, indeed, that we may yet add considerably to those we already possess, and with advantage; but there appears to be no reason for dispensing with any one of them. When we consider how varied are the races of man, and how dissimilar are the climatic conditions which affect him, and how in each climate the occupations, the surrounding circumstances, and even the individual peculiarities of the inhabitants, largely differ, we shall be constrained to admit that any one of all the sources of food hitherto known may be made available, may in its turn become desirable, and even essential to life.

To an inhabitant of the Arctic Circle, for example, a vegetarian diet would be impracticable, because the elements of it cannot be produced in that region; and were it possible to supply him with them, life could not be supported thereby. Animal food in large quantity is necessary to sustain existence in the low temperature to which he is exposed. But I desire to oppose any scheme for circumscribing the food resources of the world, and any form of a statute of limitations to our diet, not merely because it can be proved inapplicable, as in the case of the Esquimaux, under certain local and circumscribed conditions, but because I hold that the principle of limiting mankind to the use of any one class of foods among many is in itself an erroneous one. Thus, for example, while sympathizing to a large extent myself with the practice of what is called "vegetarianism" in diet, and knowing how valuable the ex-

clusive or almost exclusive use of the products of the vegetable kingdom may be for a considerable number of the adult population of our own and of other countries in the temperate zones, and for most of that which inhabits the torrid zone, I object strongly to a dogmatic assertion that such limitation of their food is desirable for any class or body of persons whatever. Moreover, an exclusive or sectarian spirit always creeps in sooner or later wherever an "ism" of any kind leads the way, which sooner or later brings in its train assertions barely supported by fact, the equivocal use of terms, evasion—in short, untruthfulness, unintended and unperceived by the well-meaning people who, having adopted the "ism," at last suffer quite unconsciously from obscurity of vision, and are in danger of becoming blind partisans.

Thus the term "vegetarian," as used to distinguish a peculiar diet, has no meaning whatever unless it implies that all the articles of food so compromised are to be products of the vegetable kingdom; admitting, of course, the very widest scope to that term. In that sense the vegetable kingdom may be held to embrace all the cereals, as wheat, barley, rye, and oats, maize, rice, and millet; all the leguminous plants—beans, peas, and lentils; all the roots and tubers containing chiefly starch, as the potato, yam, etc.; the plants yielding sago and arrowroot; the sources of sugar in the cane and beet, etc.; all the garden herbs and vegetables; the nuts, and all the fruits. Then there are the olive and other plants yielding the important element of oil in great abundance. An admirable assortment, to which a few minor articles belong, not necessary to be specified here. An excellent display of foods, which suffice to support life in certain favorable conditions, and which may be served in varied and appetizing forms. And to those who find their dietary within the limits of this list the name of vegetarian is rightly applicable. But such is by no means the practice of the self-styled vegetarians we usually meet with. It was only the other evening, in a crowded drawing-room, that a handsome, well-developed, and manifestly well-nourished girl—"a picture of health" and vigor—informed me, with extreme satisfaction, that she had been a "vegetarian" for several months, and how thoroughly that dietary system agreed with her. She added that she was recommending all her friends

(how natural!) to be vegetarians also, continuing, "And do you not believe I am right?" On all grounds, one could only assure her that she had the appearance of admirably illustrating the theory of her daily life, whatever that might be, adding, "But now will you tell me what your diet consists of?" As happens in nineteen cases out of twenty, my young and blooming vegetarian replied that she took an egg and milk in quantity, besides butter, not only at breakfast, but again in the form of pudding, pastry, fritter, or cake, etc., to say nothing of cheese, at each of the two subsequent meals of the day: animal food, it is unnecessary to say, of a choice, and some of it in a concentrated form. To call a person thus fed a vegetarian is a palpable error; to proclaim oneself so almost requires a stronger term to denote the departure from accuracy involved. Yet so attractive to some, possessing a moral sense not too punctilious, is the small distinction attained by becoming sectarian, and partisans of a quasi-novel and somewhat questioned doctrine, that an equivocal position is accepted in order to retain if possible the term "vegetarian" as the ensign of a party, the members of which consume abundantly strong animal food, abjuring it only in its grosser forms of flesh and fish. And hence it happens, as I have lately learned, that milk, butter, eggs, and cheese are now designated in the language of "vegetarianism" by the term "animal *products*," an ingenious but evasive expedient to avoid the necessity for speaking of them as animal food.

Let us, for one moment, only, regard milk, with which, on nature's plan, we have all been fed for the first year or thereabout of our lives, and during which term we made a larger growth and a more important development than in any other year among the whole tale of the life which has passed, however long it may have been. How, in any sense, can that year of plenty and expansion, which we may have been happy and fortunate enough to owe—an inextinguishable debt—to maternal love and bounty, be said to be a year of "vegetarian diet?" Will any man henceforward dare thus to distinguish the source from which he drew his early life? Unhappily, indeed, for want of wisdom, the natural ration of some infants is occasionally supplemented at an early period by the addition of vegetable matter; but the practice is almost always undesirable,

and is generally paid for by a sad and premature experience of indigestion to the helpless baby. Poor baby! who, unlike its progenitors in similar circumstances, while forced to pay the penalty, has not even had the satisfaction of enjoying a delightful but naughty dish beforehand.

The vegetarian restaurant at the Health Exhibition last summer supplied thousands of excellent and nutritious meals at a cheap rate, to the great advantage of its customers; but the practice of insisting with emphasis that a "vegetable diet" was supplied was wholly indefensible, since it contained eggs and milk, butter and cheese, in great abundance.

It is not more than six months since I observed in a well-known weekly journal a list of some half-dozen recipes for dishes recommended on authority as specimens of vegetarian diet. All were savory combinations, and every one contained eggs, butter, milk, and cheese in considerable quantity, the vegetable elements being in comparatively small proportion.

It is incumbent on the supporters of this system of mixed diet to find a term which conveys the truth, that truth being that they abjure the use, as food, of all animal flesh. The words "vegetable" and "vegetarian" have not the remotest claim to express that fact, while they have an express meaning of their own in daily use—namely, the obvious one of designating products of the vegetable kingdom. It may not be easy at once to construct a simple term which differentiates clearly from the true vegetarian the person who also uses various foods belonging to the animal kingdom, and who abjures only the flesh of animals. But it is high time that we should be spared the obscure language, or rather the inaccurate statement to which milk and egg consumers are committed, in assuming a title which has for centuries belonged to that not inconsiderable body of persons whose habits of life confer the right to use it. And I feel sure that my friends, "the vegetarians," living on a mixed diet, will see the necessity of seeking a more appropriate designation to distinguish them; if not, we must endeavor to invent one for them.

But why should we limit by dogma or otherwise man's liberty to select his food and drink? I appreciate the reason for abstaining from alcoholic drinks derived from benevolent motive or religious principle, and entertain for it the highest

respect, although I cannot myself claim the merit of self-denial or the credit of setting an example—abstaining, like many others, solely because experience has taught that to act otherwise is manifestly to do myself an injury.

This brings me to the point which I desire to establish, namely, that the great practical rule of life in regard of human diet will not be found in enforcing limitation of the sources of food which nature has abundantly provided. On the contrary, that rule is fulfilled in the perfect development of the art of adapting food of any and every kind to the needs of the body, according to the very varied circumstances of the individual at different ages, with different forms of activity, with different inherent personal peculiarities, and with different environments. This may read at first sight, perhaps, like a truism; but how important is the docrine, and how completely it is ignored in the experience of life by most people, it will be my object here to show.

I have already alluded to the fact that the young and rapidly growing infant, whose structures have to be formed on the soft and slender lines laid down before birth, whose organs have to be solidified and expanded at one and the same time, in which tissues of all kinds are formed with immense rapidity and activity, requires animal food ready prepared in the most soluble form for digestion and assimilation. Such a food is milk; and if the human supply is insufficient, we obtain in its place that of the cow chiefly; and during the first year of life milk constitutes the best form of food. After that time other kinds of nourishment, mostly well-cooked wheaten flour in various shapes, begin to be added to the milk, which long continues to be a staple source of nourishment to the young animal. Eggs, a still more concentrated form of similar food, follow, and ultimately the dietary is enlarged by additions of various kinds as the growing process continues through youth to puberty, when liberty arrives more or less speedily to do in all such matters "as others do." On reaching manhood, the individual, in ninety-nine cases out of a hundred, acquires the prevailing habit of his associates, and he feeds after that uniform prescription of diet which prevails, with little disposition to question its suitability to himself. A young fellow in the fulness of health, and habituated to daily

active life in the open air, may, under the stimulus of appetite and enjoyment in gratifying it, often largely exceed both in quantity and variety of food what is necessary to supply all the demands of his system, without paying a very exorbitant price for the indulgence. If the stomach is sensitive or not very powerful, it sometimes rejects an extravagant ration of food, either at once or soon after the surfeit has been committed; but if the digestive force is considerable, the meals, habitually superabundant as they may be, are gradually absorbed, and the surplus fund of nutrient material unused is stored up in some form. When a certain amount has been thus disposed of, the capacity for storage varying greatly in different persons, an undesirable balance remains against the feeder, and in young people is mostly rectified by a "bilious attack," through the agency of which a few hours of vomiting and misery square the account. Then the same process of overfeeding recommences with renewed appetite and sensations of invigorated digestion, until in two or three, or five or six, weeks, according to the ratio existing been the amount of food ingested and the habit of expending or eliminating it from the body, the recurring attack appears and again clears the system, and so on during several years of life. If the individual takes abundant exercise, and expends much energy in the business of life, a large quantity of food can be properly disposed of. Such a person enjoys the pleasure of satisfying a healthy appetite, and in doing so with ordinary prudence not only takes no harm, but consolidates the frame and enables it to resist those manifold unseen sources of evil which are prone to affect injuriously the feeble. On the other hand, if he is inactive, takes little exercise, spends most of his time in close air and in a warm temperature, shaping his diet, nevertheless, on the liberal scheme just described, the balance of unexpended nutriment soon tells more or less heavily against him, and must be thrown off in some form or another.

After the first half or so of life has passed away, instead of periodical sickness, the unemployed material may be relegated in the form of fat to be stored on the external surface of the body, or be packed among the internal organs, and thus he or she may become corpulent and heavy, if a facility for converting appropriate material into fat is consistent with the con-

stitution of the individual; for some constitutions appear to be without the power of storing fat, however rich the diet or inactive their habits may be. When, therefore, this process cannot take place, and in many instances also when it is in action, the over-supply of nutritious elements ingested must go somewhere, more or less directly, to produce disease in some other form, probably at first interfering with the action of the liver, and next appearing as gout or rheumatism, or to cause fluxes and obstructions of various kinds. Thus recurring attacks of gout perform the same duty, or nearly so, at this period of life, that the bilious attacks accomplished in youth, only the former process is far more damaging to the constitution and materially injures it. In relation to liver derangement and inordinate fat production, we may see the process rapidly performed before our eyes, if we so desire, in the cellars of Strasburg. For the unfortunate goose which is made by force to swallow more nutritive matter than is good for it, in the shape of food which, excellent in appropriate conditions, is noxious to the last degree when not expended by the consumer—I mean good milk and barley-meal—falls a victim, in less than a month of this gluttonous living, to that form of fatty liver which, under the name of *foie gras*, offers an irresistible charm to the gourmet at most well-furnished tables.* The animal being thus fed is kept in a close, warm temperature and without exercise, a mode of feeding and a kind of life which one need not after all go to Strasburg to observe, since it is not difficult to find an approach to it, and to watch the principle carried out, although only to a less considerable extent, anywhere and everywhere around us. Numerous individuals of both sexes, who have no claim by the possession of ornithological characteristics to consanguinity with the animal just named, may be said nevertheless to manifest signs of relation in some sort thereto—not creditable, perhaps, to the goose, the Strasburg dietary being an enforced one —by their habit of absorbing superfluous quantities of nutri-

* In passing I would strongly commend the condition of those poor beasts to the consideration of the Antivivisection Society, since more disease is artificially produced among them, in order to furnish our tables with the *pâté*, than by all the physiologists of Europe who, in the interest, not of the human palate, but of human progress as affected by therapeutic knowledge, sometimes propagate and observe certain unknown forms of disease among a few of the lower animals.

ment while living a life of inactivity, and of course sooner or later become invalid in body, unhappy in temper, and decrepit in regard of mental power.

For let us observe that there are two forces concerned in this matter of bountiful feeding which must be considered a little further. I have said that a hearty, active young fellow may eat perhaps almost twice as much as he requires to replace the expenditure of his life and repair the loss of the machine in its working without much inconvenience. He, being robust and young, has two functions capable of acting at the maximum degree of efficiency. He has a strong digestion, and can convert a large mass of food into fluid aliment suitable for absorption into the system; that is function the first. But besides this he has the power of bringing into play an active eliminating force, which rids him of all the superfluous materials otherwise destined, as we have seen, to become mischievous in some shape; and that is function the second. To him it is a matter of indifference for a time whether the quantity of material which his food supplies to the body is greater than his ordinary daily expenditure demands, because his energy and activity furnish unstinted opportunities of eliminating the surplus at all times. But the neglect to adjust a due relation between the "income" and the "output" cannot go on forever without signs of mischief in some quarter. A tolerably even correspondence between the two must by some means be maintained to ensure a healthy condition of the body. It is failure to understand, first, the importance of preserving a near approach to equality between the supply of nutriment to the body and the expenditure produced by the activity of the latter; and, secondly, ignorance of the method of attaining this object in practice, which give rise to various forms of disease calculated to embitter and shorten life after the period of prime has passed.

Let it be understood that in the matters of feeding and bodily activity a surplus of unexpended sustenance—here referred to as "the balance"—is by its nature exactly opposite to that which prudent men desire to hold with their bankers in affairs of finance. In this respect we desire to augment the income, endeavoring to confine expenditure within such limits as to maintain a cash balance in our favor to meet exigencies not

perhaps foreseen. But in order to preserve our health when that period of blatant, rampant, irrepressible vigor which belongs to youth has passed away, it is time to see that our income of food and our expenditure through such activity as we have constitute an harmonious equality, or nearly so. It is the balance against us of nutritive material which becomes a source of evil. And it is a balance which it is so agreeable and so easy to form, and which often so insidiously augments, unless we are on our guard against the danger. The accumulated stores of aliment, the unspent food, so to speak, which saturate the system are happily often got rid of by those special exercises to which so large a portion of time and energy is devoted by some people. It is to this end that men at home use dumbbells or heavy clubs, or abroad shoot, hunt, and row, or perform athletic and pedestrian feats, or sweat in Turkish baths, or undergo a drench at some foreign watering-place—all useful exercises in their way, but pursued to an extent unnecessary for any other purpose than to eliminate superfluous nutrient materials, which are occasioning derangements in the system, for which these modes of elimination are the most efficient cure, and are thus often ordered by the medical adviser. But as we increase in age—when we have spent, say, our first half-century —less energy and activity remain, and less expenditure can be made; less power to eliminate is possible at fifty than at thirty, still less at sixty and upward. Less nutriment, therefore, must be taken in proportion as age advances, or rather as activity diminishes, or the individual will suffer. If he continues to consume the same abundant breakfast, substantial lunches, and heavy dinners, which at the summit of his power he could dispose of almost with impunity, he will in time certainly either accumulate fat or become acquainted with gout or rheumatism, or show signs of unhealthy deposit of some kind in some part of the body, processes which must inevitably empoison, undermine, or shorten his remaining term of life. He must reduce his "intake," because a smaller expenditure is an enforced condition of existence. At seventy the man's power has further diminished, and the nutriment must correspond thereto, if he desires still another term of comfortable life. And why should he not? Then at eighty, with less activity there must be still less "support." And on this principle he may

yet long continue, provided he is not the victim of an inherited taint or vice of system too powerful to be dominated, or that no unhappy accident inflicts a lasting injury on the machine, or no unfortunate exposure to insanitary poison has shaken the frame by long exhausting fever; and then with a fair constitution he may remain free from serious troubles, and active to a right good old age, reaching far beyond the conventional seventy years which were formerly supposed to represent the full limit of man's fruitful life and work on earth.

But how opposed is this system to the favorite popular theory! Have we not all been brought up in the belief that the perfection of conduct consists, truly enough, in temperate habits in youth and middle life; such duty, however, being mostly enforced by the pleasant belief that when age arrived we might indulge in that extra "support"—seductive term, often fruitful of mischief—which the feebleness of advancing years is supposed to deserve? The little sensual luxuries, hitherto forbidden, now suggested by the lips of loving woman, and tendered in the confidence of well-doing by affectionate hands, are henceforth to be gratefully accepted, enjoyed, and turned to profit in the evening of our declining years. The extra glass of cordial, the superlatively strong extract of food, are now to become delicate and appropriate aids to the enfeebled frame. Unhappily for this doctrine, it is, on the contrary, precisely at this period that concentrated aliments are not advantageous or wholesome, but are to be avoided as sources generally prolific of trouble. If the cordial glass and the rich food are to be enjoyed at any time, whether prudently or otherwise, like other pleasures, they must be indulged when strength and activity are great; in other words, when eliminating power is at its maximum, assuredly not when the circulation is becoming slow and feeble, and the springs of life are on the ebb. For the flow of blood cannot be driven into any semblance of the youthful torrent by the temporary force of stimulants, nor is it to be overcharged by the constant addition of rich elements which can no longer be utilized. And thus it is impossible to deny that an unsuspected source of discomfort, which in time may become disease, sometimes threatens the head of the household—a source which I would gladly pass over if duty did not compel me to notice it, owing as it is to

the sedulous and tender care taken by the devoted, anxious partner of his life, who in secret has long noted and grieved over her lord's declining health and force. She observes that he is now more fatigued than formerly after the labors of the day, is less vigorous for business, for exercise, or for sport, less energetic every way in design and execution. She naturally desires to see him stronger, to sustain the enfeebled power which age is necessarily undermining; and with her there is but one idea, and it is practically embodied in one method—viz., to increase his force by augmenting his nourishment. She remonstrates at every meal at what she painfully feels is the insufficient portion of food he consumes. He pleads in excuse, almost with the consciousness of guilt, that he has really eaten all that appetite permits; but he is besought with plaintive voice and affectionate entreaty "to try and take a little more," and, partly to stay the current of gentle complaint, partly to gratify his companion, and partly, as with a faint internal sigh he may confess to himself, "for peace and comfort's sake," he assents, and with some violence to his nature forces his palate to comply, thus adding a slight burden to the already satiated stomach. Or if, perchance, endowed with a less compliant nature, he is churlish enough to decline the proffered advice, and even to question the value of a cup of strong beef tea or egg whipped up with sherry, which unsought has pursued him to his study, or been sent to his office between eleven and twelve of the forenoon, and which he knows by experience must, if swallowed, inevitably impair an appetite for lunch, then not improbably he will fall a victim to his solicitous helpmeet's well-meaning designs in some other shape. There is the tasteless calf's-foot jelly, of which a portion may be surreptitiously introduced into a bowl of tea with small chance that its presence will be detected, especially if accompanied by a good modicum of cream; or the little cup of cocoa or of coffee masking an egg well beaten and smoothly blended to tempt the palate—types of certain small diplomatic exercises, delightful, first, because they are diplomatic and not direct in execution; and, secondly, because the supporting system has been triumphantly maintained, my lord's natural and instinctive objections thereto notwithstanding.

But the loving wife—for whom my sympathy is not more pro-

found than is my sorrow for her almost incurable error in relation to this single department of her duty—is by no means the only source of fallacious counsel to the man whose strength is slowly declining with age. We might also imagine him to be the object of a conspiracy, so numerous are the temptations which beset him on every side. The daily and weekly journals display column after column of advertisements, enumerating all manner of edibles and drinkables, and loudly trumpeting their virtues, the chief of which is always declared to be the abundance of some quality averred to be at once medicinal and nutritious. Is it bread that we are conjured to buy? Then it is warranted to contain some chemical element; let it be, for example, "the phosphate in large proportion"—a mysterious term which the advertising tradesman has for some time past employed to signify a precious element, the very elixir of life, which somehow or other he has led the public to associate with the nutriment of the brain and nervous system, and vaunts accordingly. He has evidently caught the notion from the advertising druggist, who loudly declares his special forms of half food, half physic, or his medicated preparations of beef and mutton, to contain the elements of nutrition in the highest form of concentration, among which have mostly figured the aforesaid "phosphates"—as if they were not among the most common and generally prevalent of the earthy constituents of all our food! Then, lest haply a stomach unaccustomed to the new and highly concentrated materials should, as is not improbable, find itself unequal to the task of digesting and absorbing them, a portion of gastric juice, borrowed for the occasion, mostly from the pig, is associated therewith to meet, if possible, that difficulty, and so to introduce the nourishment by hook or by crook into the system. I don't say the method described may not be useful in certain cases, and on the advice of the experienced physician, for a patient exhausted by disease, whose salvation may depend upon the happy combination referred to. But it is the popular belief in the impossibility of having too much of that or of any such good thing, provided only it consists of nutritious food, that the advertiser appeals to, and appeals successfully, and with such effect that the credulous public is being gulled to an enormous extent.

Then, even our drink must now be nutritious! Most persons might naturally be aware that the primary object of drink is to satisfy thirst, which means a craving for the supply of water to the tissues—the only fluid they demand and utilize when the sensation in question is felt. Water is a solvent of solids, and is more powerful to this end when employed free from admixture with any other solid material. It may be flavored, as in tea and otherwise, without impairing its solvent power, but when mixed with any concrete matter, as in chocolate, thick cocoa, or even with milk, its capacity for dissolving—the very quality for which it was demanded—is in great part lost. So plentiful is nutriment in solid food, that the very last place where we should seek that quality is the drink which accompanies the ordinary meal. Here at least we might hope to be free from an exhortation to nourish ourselves, when desirous only to allay thirst or moisten our solid morsels with a draught of fluid. Not so; there are even some persons who must wash down their ample slices of roast beef with draughts of new milk!—an unwisely devised combination even for those of active habit, but for men and women whose lives are little occupied by exercise, it is one of the greatest dietary blunders which can be perpetrated.

One would think it was generally known that milk is a peculiarly nutritive fluid, adapted for the fast-growing and fattening young mammal—admirable for such, for our small children; also serviceable to those whose muscular exertion is great, and, when it agrees with the stomach, to those who cannot take meat. For us who have long ago achieved our full growth, and can thrive on solid fare, it is altogether superfluous and mostly mischievous as a drink.

Another agent in the combination to maintain for the man of advancing age his career of flesh-eater is the dentist. Nothing is more common at this period of life than to hear complaints of indigestion, experienced, so it is affirmed, because mastication is imperfectly performed for want of teeth. The dentist deftly repairs the defective implements, and the important function of chewing the food can be henceforth performed with comfort. But without any intention to justify a doctrine of final causes, I would point out the significant fact that the disappearance of masticating powers is mostly coincident with

the period of life when that species of food which most requires their action—viz., solid animal fibre—is little, if at all, required by the individual. It is during the latter third of his career that the softer and lighter foods, such as well-cooked cereals, some light mixed animal and vegetable soups, and also fish, for which teeth are barely necessary, are particularly valuable and appropriate. And the man with imperfect teeth, who conforms to nature's demand for a mild, non-stimulating dietary in advanced years, will mostly be blessed with a better digestion and sounder health than the man who, thanks to his artificial machinery, can eat and does eat as much flesh in quantity and variety as he did in the days of his youth. Far be it from me to undervalue the truly artistic achievements of a clever and experienced dental surgeon, or the comfort which he affords. By all means let us have recourse to his aid when our natural teeth fail, for the purpose of vocal articulation, to say nothing of their relation to personal appearance; on such grounds the artificial substitutes rank among the necessaries of life in a civilized community. Only let it be understood that the chief end of teeth, so far as mastication is concerned, has in advancing age been to a great extent accomplished, and that they are now mainly useful for the purposes just named. But I cannot help adding, that there are some grounds for the belief that those who have throughout life from their earliest years consumed little or no flesh, but have lived on a diet chiefly or wholly vegetarian, will be found to have preserved their teeth longer than those who have always made flesh a prominent part of their daily food.

Then there is that occasional visit to the tailor, who, tape in hand, announces in commercial monotone to the listening clerk the various measurements of our girth, and congratulates us on the gradual increase thereof. He never in his life saw you looking so well, and "fancy, sir, you are another inch below your armpits"—a good deal below—"since last year!" insidiously intimating that in another year or so you will have nearly as fine a chest as Heenan. And you, poor, deluded victim, are more than half willing to believe that your increasing size is an equivalent to increasing health and strength, especially as your wife emphatically takes that view, and regards your augmenting portliness with approval. Ten years

have now passed away since you were forty, and by weight twelve stone and a half—a fair proportion for your height and build. Now you turn the scale to one stone more, every ounce of which is fat; extra weight to be carried through all the labors of life. If you continue your present dietary and habits, and live five or seven years more, the burden of fat will be doubled; and that insinuating tailor will be still congratulating you. Meantime you are "running the race of life" —a figure of speech less appropriate to you at the present moment than it formerly was—handicapped by a weight which makes active movement difficult, up-stair ascents troublesome, respiration thick and panting. Not one man in fifty lives to a good old age in this condition. The typical man of eighty or ninety years, still retaining a respectable amount of energy of body and mind, is lean and spare, and lives on slender rations. Neither your heart nor your lungs can act easily and healthily, being oppressed by the gradually gathering fat around. And this because you continue to eat and drink as you did, or even more luxuriously than you did, when youth and activity disposed of that moiety of food which was consumed over and above what the body required for sustenance. Such is the import of that balance of unexpended aliment which your tailor and your foolish friends admire, and the gradual disappearance of which, should you recover your senses and diminish it, they will still deplore, half frightening you back to your old habits again by saying: "You are growing thin; *what can be the matter with you?*" Insane and mischievous delusion!

It is interesting to observe that the principle I have thus endeavored to illustrate and support, little as it is in accordance with the precept and practice of modern authority, was clearly enunciated so long ago as the sixteenth century. The writings of Luigi Cornaro, who was born of noble family in Venice soon after the middle of the fifteenth century, and was contemporary for seventy years with Titian, wrote his first essay on the subject of regimen and diet for the aged when eighty-three years of age, producing three others during the subsequent twelve years.* His object was to show that, with increasing

* Discorsi della Vita Sobria, del Signor Luigi Cornaro. An English edition, with translation, was published by Benjamin White, at Horace's Head, in Fleet Street, London, 1768. Cornaro's first work was published in Padua in 1558. In

age and diminished powers, a corresponding decrease in the quantity of food must be taken in order to preserve health. He died at Padua, "without any agony, sitting in an elbow-chair, being above an hundred years old."

Thus he writes:

"There are old lovers of feeding who say that it is necessary they should eat and drink a great deal to keep up their natural heat, which is constantly diminishing as they advance in years; and that it is, therefore, their duty to eat heartily, and of such things as please their palate, be they hot, cold, or temperate; and that, were they to lead a sober life, it would be a short one. To this I answer that our kind mother, Nature, in order that old men may live still to a greater age, has contrived matters so that they should be able to subsist on little, as I do, for large quantities of food cannot be digested by old and feeble stomachs. . . . By always eating little the stomach, not being much burdened, need not wait long to have an appetite. It is for this reason that dry bread relishes so well with me; and I know it from experience, and can with truth affirm, I find such sweetness in it that I should be afraid of sinning against temperance, were it not for my being convinced of the absolute necessity of eating of it, and that we cannot make use of a more natural food. And thou, kind parent Nature, who actest so lovingly by thy aged offspring, in order to prolong his days, hast contrived matters so in his favor that he can live upon very little; and, in order to add to the favor, and do him still greater service, hast made him sensible that, as in his youth he used to eat twice a day, when he arrives at old age he ought to divide that food, of which he was accustomed before to make but two meals, into four; because, thus divided, it will be more easily digested; and, as in his youth he made but two collations in the day, he should in his old age make four, provided, however, he lessens the quantity as his years increase.

"And this is what I do, agreeably to my own experience; and, therefore, my spirits, not oppressed by much food, but barely kept up, are always brisk, especially after eating,

his last, a letter written to Barbaro, patriarch of Aquileia, he gives a description of his health and vigor when ninety-five years old. A paper in The Spectator was one of the first notices of him in this country. See vol. iii., No. 195.

so that I am obliged then to sing a song, and afterward to write.

"Nor do I ever find myself the worse for writing immediately after meals, nor is my understanding ever clearer, nor am I apt to be drowsy, the food I take being in too small a quantity to send up any fumes to the brain. Oh, how advantageous it is to an old man to eat but little! Accordingly I, who know it, eat but just enough to keep body and soul together."

Cornaro ate of all kinds of food, animal as well as vegetable, but in very small quantity, and he drank moderately of the light wine of his country, diminishing his slender rations as age increased. I am quite aware that I am reciting a story which must be familiar to some of the readers of this review. But it is by no means widely known, and is too apt an example of the value of the law under consideration not to be referred to here.

It must now be clearly understood, as a general rule for men at all ages, that the amount of food ingested ought to accord within certain narrow limits with the amount of force employed for the purposes of daily life. But there is a certain qualification, apparent but not real, of the principle thus enunciated, which must be referred to here in order to prevent misunderstanding or misinterpretation of my meaning in relation to one particular. It is right and fitting that a certain amount of storage material, or balance, should exist as a reserve in the constitution of every healthy man. Every healthy individual, indeed, necessarily possesses a stored amount of force, which will stand him in good stead when a demand arises for prolonged unusual exertion, or when any period of enforced starvation occurs, as during a lingering fever or other exhausting disease. The existence of this natural and healthy amount of reserved force is of course presupposed throughout all my remarks, and its extreme value is taken for granted. That undue amount of stored nutriment, that balance which has been referred to as prejudicial to the individual, is a quantity over and above the natural reserve produced by high health; for when augmented beyond that point the material takes the form of diseased deposit, and ceases to be an available source of nutriment. Even the natural amount of store or

reserve is prone to exceed the necessary limit in those who are healthy or nearly so. Hence it is that in all systems of training for athletic exploits—which is simply a process of acquiring the highest degree of health and strength attainable, in view of great or prolonged exertion—some loss of weight is almost invariably incurred in developing a perfect condition. In other words, almost any man who sets himself to acquire by every means in his power the best health possible for his system, does in the process necessary thereto throw off redundant materials, the presence of which is not consistent with the high standard of function required. Thus what is sometimes called "overtraining" is a condition in which the storage is reduced too much, and some weakening is incurred thereby; while "undertraining" implies that the useless fatty and other matters have not been sufficiently got rid of, so that the athlete is encumbered by unnecessary weight, and is liable to needless embarrassments, telling against his chances in more ways than one. The exact and precise balance between the two conditions is the aim of the judicious trainer.

We are thus led to the next important consideration, namely, that although broad rules or principles of diet may be enunciated as applicable to different classes of people in general, no accurate adaptation to the individual is possible without a knowledge of his daily habits and life, as well as to some extent of his personal peculiarities. No man, for example can tell another what he can or ought to eat, without knowing what are the habits of life and work—mental and bodily—of the person to be advised. Notwithstanding which, no kind of counsel is more frequently tendered, in common conversation by one stranger with another, than that which concerns the choice of food and drink. The adviser feels himself warranted by the experience that some particular combination of nourishment suits his own stomach, to infer without hesitation that this dish will be therefore acceptable to the stomachs of all his neighbors. Surely the intelligence of such a man is as slender as his audacity and presumption are large. It would not be more preposterous if, having with infinite pains obtained a last representing precisely the size and the peculiarities in form of his own foot, he forthwith solemnly adjured all other persons to adopt boots made upon that model, and on none other.

Only it may be assumed that there is probably more difference between stomachs and their needs among different individuals than among the inferior extremities referred to for the purpose of illustration. Thus, in regard of expenditure of food, how great is the difference between that of a man who spends ten or twelve hours of the day at the work of a navvy, as an agricultural laborer in harvest-time, or in draining or trenching land, as a sawyer, a railway porter, or a bricklayer's laborer, or let me add that of an ardent sportsman, as compared with the expenditure of a clerk who is seated at the desk, of individuals engaged in literary and artistic pursuits demanding a life mostly sedentary and spent indoors, with no exercise but that which such persons voluntarily take as a homage to hygienic duty, and for a short period borrowed at some cost from engagements which claim most of their time and nearly all their energies. While the manual laborers rarely consume more food than they expend, and are, if not injured by drink or by undue exposure to the weather, mostly hale and hearty in consequence, the latter are often martyrs to continued minor ailments, which gradually increase and make work difficult and life dreary. Few people will believe how easy it is in most instances to meet the difficulty by adopting appropriate food, and that such brain-workers can really enjoy a fair degree of health and comfort by living on light food, which does not require much force to digest and much muscular activity to assimilate; a diet, moreover, which is important to some of these from another point of view—the financial one—inasmuch as it is at least less costly by one-half than the conventional meals which habit or custom prescribes alike to large classes of men in varied conditions of life. But there is another and more important economic gain yet to be named, as realizable through the use of a light and simple dietary. It is manifested by the fact that a greater expenditure of nerve power is demanded for the digestion of heavy meat-meals than for the lighter repasts which are suitable to the sedentary; from which fact it results of course that this precious power is reserved for more useful and more delightful pursuits than that of mere digestion, especially when this is not too well performed.

But those who have little time for exercise, and are compelled to live chiefly within doors, must endeavor to secure, or

should have secured for them as far as possible by employers, by way of compensation, a regular supply of fresh air without draughts, an atmosphere as free from dust and other impurities as can be obtained, with a good supply of light, and some artificial warmth when needed. These necessities granted, cereal foods, such as well-made bread in variety and vegetable produce, including fruits, should form a great part of the diet consumed, with a fair addition of eggs and milk if no meat is taken, and little of other animal food than fish. On such a dietary, and without alcoholic stimulants, thousands of such workers as I have briefly indicated may enjoy with very little exercise far better health and more strength than at present they experience on meat and heavy puddings, beer, baker's bread, and cheese. Of course there are workers who belong to neither of the two extreme classes indicated, and whose habits cannot be described as sedentary, but who occupy a middle place between the two. For such, some corresponding modification of the dietary is naturally appropriate. But it is a vulgar error to regard meat in any form as necessary to life; if for any it is necessary, it is for the hard-working out-door laborers above referred to, and for these a certain proportion is no doubt desirable. Animal flesh is useful also as a concentrated form of nutriment, valuable for its portability; and for the small space it occupies in the stomach, unrivalled in certain circumstances. Like every other description of food, it is highly useful in its place, but is by no means necessary for a large proportion of the population. To many it has become partially desirable only by the force of habit, and because their digestive organs have thus been trained to deal with it, and at first resent a change. But this being gradually made, adaptation takes place, and the individual who has consumed two or three meat-meals daily with some little discomfort, chiefly from being often indisposed to make active exertions, becomes, after sufficient time has elapsed, stronger, lighter, and happier, as well as better tempered and manifestly healthier, on the more delicate dietary sketched. People in general have very inadequate ideas of the great power of habit alone in forming what they believe to be innate personal peculiarities, or in creating conditions which are apparently part of a constitutional necessity, laws of their nature and essential to their ex-

istence. Many of these peculiarities are solely due to habit, that is, to long continuance in a routine of action, adopted it may be without motive or design; and people are apt to forget, that if a routine of a precisely opposite character had been adopted, precisely opposite conditions would have been established, and opposite peculiarities would have become dominant, as their contraries are now. Alterations in the dietary, especially of elderly persons, should be made gradually and with caution. This condition fulfilled, a considerable change may be effected with satisfactory results, when circumstances render it necessary. To revert once more to the question of flesh-eating, it should be remarked that it appears to be by no means a natural taste with the young. Few children like that part of the meal which consists of meat, but prefer the pudding, the fruit, the vegetables, if well dressed, which unhappily is not often the case. Many children manifest great repugnance to meat at first, and are coaxed and even scolded by anxious mothers until the habit of eating it is acquired. Adopting the insular creed, which regards beef and mutton as necessary to health and strength, the mother often suffers from groundless forebodings about the future of a child who rejects flesh and manifests what is regarded as an unfortunate partiality for bread and butter and pudding. Nevertheless, I am satisfied, if the children followed their own instinct in that matter, the result would be a gain in more ways than one. Certainly if meat did not appear in the nursery until the children sent for it, it would be rarely seen there, and the young ones would as a rule thrive better on milk and eggs, with the varied produce of the vegetable kingdom.

A brief allusion must be made to the well-known and obvious fact that the surrounding temperature influences the demand for food, which, therefore, should be determined as regards quantity or kind according to the climate inhabited, or the season of the year as it affects each climate. In hot weather the dietary should be lighter, in the understood sense of the term, than in cold weather. The sultry period of our summer, although comparatively slight and of short duration, is nevertheless felt, by some persons, to be extremely oppressive; but this is mainly due to the practice of eating much animal food or fatty matters, conjoined as it often is with the habit of

drinking freely of fluids containing a small quantity of alcohol. Living on cereals, vegetables, and fruit, with some proportion of fish, and abstaining from alcoholic drinks, the same persons would probably enjoy the high temperature, and be free from the thirst which is the natural result of consuming needlessly substantial and heating food.

There is a very common term, familiar by daily use, conveying unmistakably to every one painful impressions regarding those who manifest the discomforts indicated by it—I mean the term indigestion. The first sign of what is so called may appear even in childhood; not being the consequence of any stomach disorder, but solely of some error in diet, mostly the result of eating too freely of rich compounds in which sugar and fatty matters are largely present. These elements would not be objectionable if they formed part of a regular meal, instead of being consumed, as they mostly are, between meals already abounding in every necessary constituent.

Sugar and fat are elements of value in children's food, and naturally form a considerable portion of it, entering largely into the composition of milk, which nature supplies for the young and growing animal. The indigestion of the child mostly terminates rapidly, by ejection of the offending matter. But the indigestion of the adult is less acutely felt, and is less readily disposed of. Uneasiness and incapacity for action, persisting for some time after an ordinary meal, indicate that the stomach is acting imperfectly on the materials which have been put into it. These signs manifest themselves frequently, and if nature's hints that the food is inappropriate are not taken, they become more serious. Temporary relief is easily obtained by medicine; but if the unfortunate individual continues to blame his stomach, and not the dietary he selects, the chances are that his troubles will continue, or appear in some other form. At length, if unenlightened on the subject, he becomes "a martyr to indigestion," and resigns himself to the unhappy fate, as he terms it, of "the confirmed dyspeptic."

Such a victim may perhaps be surprised to learn that nine out of ten persons so affected are probably not the subjects of any complaint whatever, and that the stomach, at any rate, is by no means necessarily faulty in its action—in short, that what is popularly termed "indigestion" is rarely a disease in any

sense of the word, but merely the natural result of errors in diet. For most men it is the penalty of conformity to the eating-habits of the majority; and a want of disposition or of enterprise to undertake a trial of simpler foods than those around them consume probably determines the continuance of their unhappy troubles. In many instances, it must be confessed that the complaint, if so it must be called, results from error, not in the quality of the food taken, but in the quantity. Eating is an agreeable process for most people, and under the influence of very small temptation, or through undue variety furnishing a source of provocation to the palate, a considerable proportion of nutritious material above what is required by the system is apt to be swallowed. Then it is also to be remembered that stomachs which vary greatly in their capacity and power to digest may all nevertheless be equally healthy and competent to exercise every necessary function. In like manner, we know that human brains which are equally sound and healthy often differ vastly in power and in activity. Thus a stomach which would be slandered by a charge of incompetence to perform easily all that it is in duty bound to accomplish may be completely incapable of digesting a small excess beyond that natural limit. Hence, with such an organ an indigestion is inevitable when this limit is only slightly exceeded. And so, when temptations are considerable and frequently complied with, the disturbance may be, as it is with some, very serious in degree. How very powerful a human stomach may sometimes be, and how large a task in the way of digestion it may sometimes perform without complaint, is known to those who have had the opportunity of observing what certain persons with exceptional power are accustomed to take as food, and do take for a long time apparently with impunity. But these are stomachs endowed with extraordinary energy, and woe be to the individual with a digestive apparatus of moderate power who attempts to emulate the performance of a neighbor at table who perchance may be furnished with such an effective digestive apparatus.

But, after all, let not the weaker man grieve overmuch at the uneven lot which the gods seem to have provided for mortals here below in regard of this function of digestion. There is a compensation for him which he has not considered, or per-

haps even heard of, although he is so moderately endowed with peptic force. A delicate stomach, which can just do needful work for the system and no more, by necessity performs the function of a careful door-porter at the entrance of the system, and, like a jealous guardian, inspects with discernment all who aspire to enter the interior, rejecting the unfit and the unbidden and all the common herd.

On the other hand, a stomach with superfluous power, of whom its master boastfully declaims that it can "digest tenpenny nails," and that he is unaccustomed to consult its likes and its dislikes if it have any, is like a careless hall-porter who admits all comers, every pretender, and among the motley visitors many whose presence is damaging to the interior. These powerful feeders after a time suffer from the unexpended surplus, and pay for their hardy temerity in becoming amenable to penalty, often suddenly declared by the onset of some serious attack, demanding complete change in regimen, a condition more or less grave. On the other hand, the owner of the delicate stomach, a man perhaps with a habit of frequently complaining of slight troubles, and always careful, will probably in the race of life, as regards the preceding pilgrim, take the place of the tortoise as against the hare. It is an old proverb that "the creaking wheel lasts longest," and one that is certainly true as regards a not powerful but nevertheless healthy stomach which is carefully treated by its owner; to whom this fact may be acceptable as a small consolation for the possession of a delicate organ.

For it is a kind of stomach which not seldom accompanies a fine organization. The difference is central, not local; a difference in the nervous system chiefly; the impressionable mental structure, the instrument of strong emotions, must necessarily be allied with a stomach to which the supply of nerve-power for digestion is sometimes temporarily deficient and always perhaps capricious. There are more sources than one of compensation to the owner of an active, impressionable brain, with a susceptible stomach possessing only moderate digestive capabilities—sources altogether beyond the imagination of many a coarse feeder and capable digester.

But it is not correct, and it is on all grounds undesirable, to regard the less powerful man as a sufferer from indigestion;

that is, as liable to any complaint to be so termed. True indigestion, as a manifestation of diseased stomach, is comparatively quite rare, and I have not one word to say of it here, which would not be the fitting place if I had. Not one person in a hundred who complains of indigestion has any morbid affection of the organs engaged in assimilating his food. As commonly employed, the word "indigestion" denotes, not a disease, but an admonition. It means that the individual so complaining has not yet found his appropriate diet: that he takes food unsuited for him, or too much of it. The food may be "wholesome enough in itself," a popular phrase permitted to appear here, first, because it conveys a meaning perceived by everyone, although the idea is loosely expressed; but secondly, and chiefly, for the purpose of pointing out the fallacy which underlies it. There is no food "wholesome in itself;" and there is no fact which people in general are more slow to comprehend. That food only is wholesome which is so to the individual; and no food can be wholesome to any given number of persons. Milk, for example, may agree admirably with me, and may as certainly invariably provoke an indigestion for my neighbor; and the same may be said of almost every article of our ordinary dietary. The wholesomeness of a food consists solely in its adaptability to the individual, and this relation is governed mainly by the influences of his age, activity, surroundings, and temperament or personal peculiarities.

Indigestion, therefore, does not necessarily, or indeed often, require medicine for its removal. Drugs, and especially small portions of alcoholic spirit, are often used for the purpose of stimulating the stomach temporarily to perform a larger share of work than by nature it is qualified to undertake; a course which is disadvantageous for the individual if persisted in. The effect on the stomach is that of the spur on the horse: it accelerates the pace, but "it takes it out" of the animal; and if the practice is long continued, shortens his natural term of efficiency.

It is an erroneous idea that a simple form of dietary, such as the vegetable kingdom in the largest sense of the term furnishes, in conjunction with a moderate proportion of the most easily digested forms of animal food, may not be appetizing and agreeable to the palate. On the contrary, I am prepared

to maintain that it may be easily served in forms highly attractive, not only to the general, but to a cultivated taste. A preference for the high flavors and stimulating scents peculiar to the flesh of vertebrate animals mostly subsides after a fair trial of milder foods when supplied in variety. And it is an experience almost universally avowed, that the desire for food is keener, that the satisfaction in gratifying appetite is greater and more enjoyable, on the part of the general light feeder than with the almost exclusively flesh-feeder. For this designation is applicable to almost all those who compose the middle-class population of this country. They consume little bread and few vegetables; all the savory dishes are of flesh, with decoctions of flesh alone for soup. The sweets are compounds of suet, lard, butter, eggs, and milk, with very small quantities of flour, rice, arrowroot, etc., which comprise all the vegetable constituents besides some fruit and sugar. Three-fourths at least of the nutrient matters consumed are from the animal kingdom. A reversal of the proportions named, that is, a fourth only from the latter source with three-fourths of vegetable produce, would furnish greater variety for the table, tend to maintain a clearer palate, increased zest for food, a lighter and more active brain, and a better state of health for most people not engaged on the most laborious employments of active life. While even for the last named, with due choice of material, ample sustenance in the proportions named may be supplied. For some inactive, sedentary, and aged persons the small proportion of animal food indicated might be advantageously diminished. I am frequently told by individuals of sixty years and upward, that they have no recollection of any previous period since reaching mature age at which they have possessed a keener relish for food than that which they enjoy at least once or twice a day since they have adopted the dietary thus described; such appetite, at all events, as has rarely offered itself during years preceding, when the choice of food was conventionally limited to the unvarying progression and array of mutton and beef, in joint, chop, and steak, arriving after a strong meat-soup, with a possible interlude of fish, and followed by puddings of which the ingredients are chiefly derived from animal sources. The penetrating odors of meat-cookery which announce their presence by escape from the kitchen, and will

pervade the air of other rooms in any private house but a large one, and which are encountered in clubs, restaurants, and hotels without stint, alone suffice to blunt the inclination for food of one who, returning from daily occupation fatigued and fastidious, desires food easy of digestion, attractive in appearance, and unassociated with any element of a repulsive character. The light feeder knows nothing of the annoyances described, finds on his table that which is delightful to a palate sensitive to mild impressions and indisposed to gross and over-powerful ones. After the meal is over, his wit is fresher, his temper more cheerful, and he takes his easy chair to enjoy fireside talk, and not to sink into a heavy slumber, which on awakening is but exchanged for a sense of discontent or stupidity.

The doctrine thus briefly and inadequately expounded in this paper may probably encounter some opposition and adverse criticism. I am quite content that this should be. Every proposal which disturbs the current habits of the time, especially when based on long-prevalent custom, infallibly encounters that fate. But of the general truth, and hence of the ultimate reception of the principles I have endeavored to illustrate, there cannot be the faintest doubt. And I know that this result, whenever it may be accomplished, will largely diminish the painful affections which unhappily so often appear during the latter moiety of adult life. And having during the last few years widely inculcated such general dietetic principles and practice, with abundant grounds for my growing conviction of their value, it appears to be a duty to call attention to them somewhat more emphatically than in preceding contributions already referred to. In so doing I have expressly limited myself to statements relating to those simple elementary facts concerning our every-day life which ought to be within the knowledge of every man, and therefore such as may most fitly be set forth in a publication outside of that field of special and technical record which is devoted to professional observation and experience.—*Nineteenth Century.*

THE NECESSITY OF PURE BOVINE VIRUS.

By W. THORNTON PARKER, M.D., *U. S. Marine Hospital Service.*

TO THE EDITOR OF THE SANITARIAN:—In the New York *Medical Record* of April 13th, there was a communication from the late Dr. Martin, of Roxbury, Mass., concerning the necessity for pure bovine virus. As Dr. Martin was, *himself*, a well-known vender of vaccine virus, it might seem as if *his* wholesale condemnation of all bovine virus, *presumably excepting his own*, was, to say the least, rather open to criticism! I send with this a copy of a communication published in the *Virginia Medical Monthly* for March, 1885:

"Our experience in several hundred cases is certainly of some value against the two (2) cases reported by Dr. Doughty! Dr. Martin's attack seems to have been so evidently directed against the New England Vaccine Company, that, as a matter of simple justice, I offer my experience with the virus furnished by that company in its defence.

"In the New York *Medical Record* of February 21st (1885), is a communication from Dr. Doughty, of Atlanta, Ga., concerning his experience with *bovine virus* in the vaccination of children. The doctor states that, 'On December 7th, I received five points of bovine lymph from the New England Vaccine Company. *Two* (2) cases were vaccinated with this bovine lymph—one normal, and one in which on the 13th day he found a slough, involving the entire thickness of the skin and cellular tissue beneath, about the size of a quarter-dollar, with abundant suppuration.'

"We have had a large experience for the past three years with this same bovine lymph from the New England Vaccine Company. Considerable quantities of it are furnished to the Chief Medical Purveyor of the United States Army, who is very particular in securing the best lymph obtainable. We have been informed that at one post a soldier was in *considera-*

ble danger after vaccination with this lymph, and in about *two hundred cases* we have had one case with symptoms similar to the one Dr. Doughty has reported. The patient, a white soldier, was excused from duty for several days, and for two or three days was confined to his bed. The arm was treated by the application of boro-glyceride, five per cent. solution, and recovered rapidly under the use of this antiseptic.

"'*If properly performed*,' vaccination with *bovine* lymph will always be found superior to *humanized virus, and in every way more desirable*. In our experience the lymph furnished by the New England Vaccine Company is excellent and trustworthy, and we know of no better in the market at present. It is not the *lymph* which is to be blamed for these severe cases now and then presenting themselves, but the system of the patient. In our practice one severe case in two hundred or more is not remarkable, and the experience of Dr. Doughty, with unfavorable results in fifty per cent. of his cases, is merely accidental. If the doctor will try again, we believe he will have better luck, and, so far as humanized virus is concerned, we beg to refer him to the *Philadelphia Medical Times*' (March 7, 1885) article (translation) concerning *Variola*, from the *Revue de Medicine*, November, 1884."—W. T. P., in *Virginia Medical Monthly*, March, 1885.

Undoubtedly, as suggested by a recent contributor in the New York *Medical Record*, poisonous instruments are very frequently the cause of many cases of serious inflammatory action following vaccination. It is well known that many medical men are careless about cleaning and properly disinfecting instruments in common use. Serious trouble has followed minor surgical operations on this account. It is not uncommon to witness the same ivory point used in successive cases of vaccination before any attempt at reasonable cleaning or disinfection has been made to protect the next patient. This is very common on board ship and in hospital practice, and of course is inexcusable. Where such gross carelessness is exhibited we must expect abnormal action of a violent grade to follow vaccination, even where a good virus is used. Knowing the fact, then, that the causes of abnormal action are so numerous in vaccination, it is hardly fair to bring forward two

or more cases to condemn a virus furnished by a responsible company, whose interests alone would oblige them to furnish the best virus obtainable.

BABY-INCUBATOR.—In a recent number of *Le Génie Civil*, Dr. Hector George gives an account of the more recent experiments with an apparatus, the original example of which was first exhibited with the chicken-hatcher at the Agricultural Fair, in Paris, in 1880, and which has been in use since that time, at the Maternity Hospital in Paris, with singularly good results. The construction is very simple, the whole affair consisting simply of a double box placed on a stand. Two panes of glass form the top of the upper box, in which is placed the baby in its cradle; and in the lower box is placed a vessel of hot water. There are openings between the upper and lower boxes, and also in the bottom of the lower box and the top of the upper one. Air from the room enters by the lower opening, and is warmed by contact with the hot-water reservoir, and rises to the upper box, from which it escapes through the opening in the top. The child is thus constantly bathed in a warm, fresh, moist atmosphere, which is kept at a temperature of eighty-six to ninety degrees, Fahrenheit, as shown by a thermometer hung in the upper box, by adding hot water to that in the reservoir. Every two hours the child is taken out to be nursed and changed, and then is replaced in its box. The influence of the still, moist, warm atmosphere on feeble infants seems to be very favorable, and the apparatus is devoted, in the hospitals, to encouraging the development of puny or prematurely-born children. The average weight of healthy children, born at the usual time, is said to be nine and one-half pounds. Those that weigh less than five pounds at birth are classed by themselves, as feeble and unlikely to live; the mortality in this class in maternity hospitals being generally sixty-five or sixty-six per cent. With the help of the baby-incubator this percentage appears to be reversed, sixty-two out of ninety-three prematurely-born children brought up in it having passed the critical period in safety.

THE MALARIA OF THE TRE FONTANE.[1]

By C. TOMMASI-CRUDELI,
Professor in the Royal University of Rome.

[REFERRING to his last communication to the Academy,[2] Professor C. Tommasi-Crudeli says he has been unable to continue his studies at Rome during the years 1881–1882 from want of material.]

It would seem that the great dryness of these two summers in the Agro Romano, and the notable diminution of temperature which took place when the autumn rains began, have limited the development of malaria in this district, not only in 1881, but in 1882. In 1880 the number of patients suffering from grave malarial fever in the hospitals of Rome was sufficiently great to enable a very large number of observations to be made in a comparatively short time upon the blood of the living and the internal organs of the dead, but from that time to the present the number of fever cases has been few, and of these by far the greater part have been relapses or slight cases of primary infection.

Despite this exceptional relative healthiness of the Agro Romano, in 1882 a grave epidemic of malaria broke out in a limited area of it, viz., at Tre Fontane (Three Fountains).

Everyone knows that there is here a monastery of Trappists, who for many years have taken in hand the improvement of the agricultural condition of the adjacent land by drainage, and by plantations of vines and eucalyptus. Parallel with this improvement of the land, it appeared that there was an improvement in its hygienic conditions, *i.e.*, a diminution in the intensity of the malaria of the locality; this good effect was attributed by most people to the plantations of eucalyptus, and to the use of a preparation of eucalyptus made by the Trappist monks, and so suggested the idea of an extension of this

[1] *Reale Accademia dei Lincei*, Anno cclxxx., 1882–1883 (*Trans.* 5, vii.).

[2] Cuboni e Marchiafava, *Nuovi Studij sulla Natura della malaria. Memorie delle Classe di Scienze fisiche*, ccc. vol. ix.

special cultivation. Close to Tre Fontane was a holding of 495 hectares, belonging to the Society of the Sisters of the Blessed Sacrament. An association of fifty families of peasants had already entered into negotiations for renting this land, with the idea of creating in this place a "cultivated centre" ("*centro abitato*") according to the prescription of the law for the improvement of the Agro Romano, but the *Giunto liquidatrice dell' asse ecclesiastica* refused to consider their proposal, and handed over the estate to the Trappists, with the idea of instituting an experiment on the beneficial effect of the eucalyptus on a large scale. In order to facilitate this experiment, a colony of convicts was established close to the convent, *i.e.*, in that part of the estate which everyone believed to be already made healthy by the eucalyptus.

The hygienic conditions under which the convicts were placed, as regards hours of work, housing, and food, were better by far than those under which the agricultural population of the Roman Campagna usually live.

Despite this, hardly had the fever season of 1880 begun, than almost the whole of the members of the penal settlement fell sick of malarial fevers more or less grave. The notion then rooted in the public mind, that it was possible to live at Tre Fontane in the bad season without risk—thanks to eucalyptus and the liqueur prepared by the monks from it—caused the founders of the colony to neglect many of the ordinary precautions which should have been taken; hence, one had to deplore a number of victims even among the prison-guards. The fact was at first denied, and then, when it was no longer possible to do so, an attempt was made to explain it by saying that in that year the malaria had manifested itself on an unusual scale in the Campagna, and that the atmosphere of Tre Fontane had been exceptionally poisoned by infected air from the surrounding localities; at all events, it was thought fit to adopt greater prudence in 1881, and when in 1882 it was desired to repeat the experiment of this colony on a grand scale, every reasonable precaution was taken, and means provided for the immediate assistance of any who might be attacked.

In the summer and autumn of 1882 every single inhabitant of Tre Fontane was attacked; amongst the monks the cases

were slight, but none escaped. Some of the convicts, also, had only mild attacks, but many others had it in a very severe, and some in its severest form (*grave e gravissima*), and after having been cured had to be sent to the baths at Civita Vecchia and Spoleto to recover their strength; almost all the guards were attacked by the fever in its gravest form, and had to be sent away. There were no deaths, because the medical assistance was prompt and well administered; three kilogrammes of quinine were used during this epidemic. One death did occur in the case of a convict, previously seriously ill from a severe chronic disorder. Nevertheless, in spite of all the care used, there was the usual cachexia among the patients which follows severe Roman fever, and for a long time after the cure of the febrile attacks the proof of this remained in the anæmic condition of most of the convicts and almost all the guards.

These facts induced the medical officer of the colony at Tre Fontane to propose that in future the work should be suspended in the most malarious season, and at a sitting of the Chamber of Deputies, January 22, 1883, repeated this proposal to the Minister of the Interior, laying special stress upon the miserable condition in which the fever leaves the prison-guards. These, in fact, invariably suffered more seriously than the convicts, as well in 1880 as in 1882. Perhaps the inactivity to which their duty compels these men during the long hours of labor of the convicts serves to collect in their organism a greater quantity of the malarial poison through the inspired air, while the convicts, on the other hand, are continually getting rid of considerable quantities, thanks to the state of activity in which their labor maintains their circulation, and to the abundance of all the secretions of their bodies which results from it. Whatever it may be, it seems unjust that these men should be exposed to the risks of contracting a disease which will leave its mark upon them for life, in a service which is not the service of the State.

As a matter of fact, many circumstances, to which it is not proper to refer here, have taken away from the works at Tre Fontane their character of an agricultural experiment undertaken in the public interest, and have caused it to assume that of a private agricultural industry, under exceptional conditions

of prosperity, worked for the sole benefit of the Trappists. We must remark the singular contrast presented by the sanitary state of the whole Agro Romano in 1882, and the great development of malaria which took place in this plague-stricken spot in it, which so many both in Italy and abroad declared to be already cured by eucalyptus plantations and a wisely-conducted high cultivation, and it cannot fail to strike all those in Italy who are interested in the vital question of the improvement of malarious soils.

After having drawn attention to these facts, above stated, I considered it my duty, in my double capacity of Professor of Experimental Hygiene in the University of Rome, and of member of the Municipal Sanitary Commission, to call the attention of Signor Berti, Minister of Agriculture, Industry, and Commerce, to them. I therefore addressed to him a letter, on November 8, 1882, in which I set forth precisely what had occurred, and prayed him to nominate a commission of competent persons to examine accurately the estate of Tre Fontane, and seek the reasons for the extraordinary outbreak of malaria.

This time there was no room for the belief, as in 1880, that it had been caused by currents of infected air coming from the surrounding country. Signor Berti showed himself disposed to undertake the inquiry, which has a great scientific and economic interest, and I think that until it has been completed it will be well to abstain from any conjecture as to the cause of this severe but limited epidemic.

The facts are, however, practically instructive, proving as they do once more to what risks of mistake we expose ourselves, if we hold *à priori* that the methods which have resulted in a permanent improvement of one malarious locality can be usefully applied to all.

The condition of such a permanent improvement is that of so modifying the physical conditions and the chemical composition of the soil as to render it incapable of producing the malarial ferment.

If all malarious soils were similarly situated, and had the same chemical composition, we should be certain of obtaining a permanent improvement in them, by the adoption of a system of cultivation by which this result had been brought about in

any one of them ; but, unfortunately, malaria is produced in soils whose situation and chemical composition is most various, so that the system by which some have been improved may fail entirely when applied to others. So with the plantations of eucalyptus, they succeed in one place and not in another. Even quite recently an inspection ordered by the French Government in Algeria proved that entire woods of eucalyptus have not produced the slightest effect upon the hygienic conditions of certain malarious localities, while in others some benefit would seem to have accrued. Besides this, in Italy, and also in Algeria (where the climate is much more favorable than ours to the growth of eucalyptus), these plants, which belong to the southern hemisphere and are there in full vegetation during the winter, are most capricious in the northern hemisphere, and sometimes whole woods of them, which have flourished for years, perish in consequence of intense cold in winter, of frost delayed into the spring, from cold and wet combined, and from other causes as yet not well determined by the botanists.

The same may be said of high cultivation. We are accustomed to judge of its useful effect on malarious soils entirely from what we know to have taken place in ancient times in many parts of Italy and Greece, which became healthy as the result of high cultivation practised for centuries. In other places, however, as, for example, at Selinunto, Agrigento, and Sibari, a healthy soil has never been obtained despite this cultivation of centuries. The same uncertainty of results obtained has been found in our times as well in Europe as in America.

We know nothing precisely about the nature of the cultivation which should be adopted in order to produce in a given species of malarious soil a final modification of its physical conditions and chemical composition which shall render it incapable of producing the poisonous ferment. At present we are feeling our way, with the result that often we obtain useful results by means of high cultivation, and as often not ; sometimes it happens that some varieties of cultivation, instead of improving the hygienic conditions of a locality, positively make them worse. And lastly, after a long series of practical experiments, which have not furnished a positive solution for any

special case, we find ourselves exposed to the painful surprises of which the improvements undertaken at Tre Fontane are an example.

To render more easy and less dangerous the practical experiments which are already in progress, and which may be suggested for the advancement of our scientific knowledge of the subject, the search for means of increasing the resisting power of the organism must be insisted upon, so that the agriculturists may be put in a position to combat the attacks of malaria. An experiment on high cultivation is of necessity a long affair, and cannot under the best circumstances be fairly carried out unless one can secure the presence of the laborers on the spot during the whole year, they *being protected* from the malaria during the bad season. This latter is a duty imposed upon us by every consideration of humanity and public interest, seeing that even in the actual state of affairs the physical degradation produced by the malaria in some of the races of Italy is most serious, although a great part of our population withdraw themselves from the danger by emigrating from malarious localities during the summer, or, what is still more to be regretted, emigrate to foreign countries from those inhospitable districts of Italy where they run the risk of dying either from hunger or fever.

Supposing that we set aside, as many are disposed to do, the humanitarian question, and confine ourselves purely to the economical one, it is clear that no proprietor can repeat an experiment on high cultivation in a locality where pernicious fever prevails, at least in the same form as that undertaken at Tre Fontane.

The government provided the Trappists with manual labor at an exceedingly low rate, even during the most dangerous season of the year, and, besides this, took upon itself all the expense of providing good housing and hospitals and excellent medical assistance, and the care of those who were struck down by fever during their convalescence.

No proprietor could repeat an experiment in this form, although it might be certain that after some years his lands, now unhealthy and yielding little, might become healthy and yield much. Therefore, if we wish practically to solve the question of the improvement of Italian soils, we must as far as

possible prevent the infection of individuals who are obliged to live on the soil to be improved.

After many attempts to obtain a mode of preserving man by means which shall cost but little, be harmless, and easy to use, I concluded, as the result of many observations made in 1880, that we ought to give preference to arsenious acid and the alkaline arseniates. In a preliminary note presented by me to the Academy, I set forth my intention of pursuing these observations in succeeding years—and this has been done by the intelligent co-operation of Cav. dott. Ricchi, chief medical officer to the southern railways, and of some great proprietors in the course of the years 1881 and 1882. The results obtained in 1881 were satisfactory enough, but I did not attach much importance to them, because in that year the development of malaria in almost the whole of Italy was at a minimum, and it would have been easy to attribute the immunity claimed to have been obtained from the use of arsenic to the general feebleness of the specific infection. But during the summer and autumn of 1882, in many places in central and southern Italy, endemic malaria was serious, and facts were obtained [1] which seemed to justify the hope expressed by me in 1880, that arsenic was a preservative both useful and easy of application. I have undertaken to represent these facts in a memorial to the Minister of Agriculture, Industry, and Commerce, and shall have the honor to submit it in brief to the judgment of the Academy.—*The Practitioner.*

AN old lady used to say that "the best way to keep children quiet is to give them something to make a noise with." The certain way to keep the nerves quiet is to give them a little healthy action, and nothing is medicine to them better than laughing and romping, even though it may be a little boisterous. Let us get all the honest pleasure we can out of this vacation, always remembering that

"Pleasure 's not a sin,
But sometimes sin 's a pleasure."

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[1] See *Practitioner*, xxxv. 37.

THE CHOLERA REMINISCENCES OF THE PAST, AND LESSONS FOR THE PRESENT.*

By W. H. WATKINS, M.D., Sanitary Director of the Auxiliary Sanitary Association, New Orleans.

THE march of cholera has been observed for ages, and its progress definitely marked. No disease has been more closely watched, and the violence of symptoms incident to the scourge renders it no lurking foe which requires much art to discover. It has invaded the United States, and on each occasion of its visitation has been traced to positive importation.

One fact must be borne in mind: Cholera has never visited Eastern Europe without having extended to America through lines of commerce. Its ravages have at times been terrific. Especially was this the case when it was first introduced in 1832.

Since that time there have been four epidemics, viz.: 1848, 1854, 1866, and 1873.

The first arrival of Asiatic cholera on this continent is attributed to the emigrant ship Carracks, which reached the Grosse Isle Quarantine Station, on the St. Lawrence River, May 3, 1832; but it had been clearly demonstrated that other vessels from Ireland had landed after having experienced cholera at sea, one of which arrived as early as April 28th.

The first outbreak occurred at Quebec, June 8, 1832, extending to Montreal; it was brought to New York State in June, where an emigrant from Montreal died at Burlington, on the 13th of that month.

Cholera was undoubtedly imported into New York City early in 1832, but records to this effect were suppressed; at least, no arrivals at the quarantine station could be found, although complete returns for the years 1831 and 1833 were obtained. It prevailed extensively during the summer and fall, and extended south and west.

*Abstract of a paper read before the Executive Committee of the Auxiliary Sanitary Association, New Orleans, August 20, 1885.

New Orleans was invaded from two sources—from New York by sea, and down the Mississippi River. The first case was reported in October, 1832.

The following is an extract from the report of the late Surgeon Thomas Lawson, Surgeon-General, U. S. A.:

"The city being the first point attacked, and the last position maintained by the enemy, without pretending to determine the cause of this mysterious disease, or its mode of propagation, one fact is certain, viz.: That no case of the disease manifested itself among us until after the arrival in port of the steamer Constitution, which had several cases on board, a number of her passengers having already fallen victims to the disease. So rapid was the pestilence in its progress, that in less than forty-eight hours it reached the lowest plantation on the Mississippi, desolating almost every spot inhabited by man.

"One of its peculiarities, observed both above the city and in the lower country, is that it frequently passes over a village or plantation, while the destruction around is terrible; and this, too, without any manifest cause, either as regards the local circumstances or the habits or condition of the people. On the east bank of the Mississippi it advanced, after scourging New Orleans and the lower country, to within a few miles of Baton Rogue, and on the west side some distance above that point.

"In New Orleans the effects of the epidemic were first manifested among the dissolute and intemperate; those who were necessarily or accidentally exposed to the weather; those who were without the means of providing themselves with wholesome food or raiment, and the miserable occupants of the damp, filthy, and crowded hovels of the upper faubourg. It having desolated the suburbs, the disease invaded the heart of the city, striking down men, women, and children indiscriminately. Here again the disease exhibited some of its eccentricities, for in many instances a house was wholly exempt from its ravages, while those on every side were places of mourning and distress."

Records of this frightful epidemic are few, and give nothing in detail respecting the desolation prevailing; but our distinguished fellow-citizen, Dr. John P. Davidson, has furnished at my request

A PEN PICTURE,

which conveys the experience of himself, a practitioner of medicine at that time, and an eye-witness to the ravages of the dread disease:

"It was known here that Asiatic cholera had been introduced into Quebec, Canada, in the spring of the year 1832, I think in the month of May; and it was also reported that cases of the disease had occurred on board one or more ships which had arrived in the city of New York about the same period. The disease gradually spread from these two points in all directions, and it is probable that infected vessels arrived from Europe at other ports.

"Notwithstanding the great alarm prevailing throughout the country in anticipation of the advent of so fell a scourge, and the discussion of the subject in New Orleans, I cannot recollect that any sanitary precautions were adopted by the city authorities, or by the citizens themselves, beyond strewing lime pretty liberally along the gutters of the streets. No hospitals were extemporized, or other provision made, for the care of the sick, excepting the organization on the part of a number of young men of 'rubbing clubs,' who banded together in a laudable spirit of humanity to relieve the sick of the violent cramps by friction with a mixture of mercurial ointment, camphor, opium, and cayenne pepper.

"Yellow fever prevailed epidemically in New Orleans during the summer of 1832, but was soon displaced by the cholera. Toward the end of October, about the 22d of the month, possibly a few days later, for I write wholly from memory, an alarm was given early in the morning that two men had died during the preceding night of cholera, on the Levee, near the French Market. No little consternation ensued throughout the city, which was enhanced by the report that cases of the disease had occurred on two vessels just arrived from a northern port, and also on board of a steamboat said to have come from Cincinnati. That night my father was called to see a Mr. Rose, who was stricken with cholera while playing a game of whist, and who died before sunrise. On the following day cases of cholera were reported from several parts of the city, some quite remote from the foci related above. The rapidity of the spread of the dis-

ease to all parts of the city, among all classes of its citizens, was remarkable. One of the earliest victims was Mr. Savigny Blanc, who, attending the funeral of a friend, as he turned from the sepulture, asked the question, 'Who next?' In a few hours he was a corpse. So very rapid was the extension of the disease, and so many were stricken down with an almost unparalleled fatality, that the wildest panic took possession of the populace.

"It became impossible for the physicians, many of whom were attacked with the disease, to minister to the vast number who sought medical aid, and so utterly overwhelmed were those who were well by the terrible scenes of suffering and death, that nothing like systematic care and nursing of the sick was possible.

"It is true that the 'rubbing clubs' heroically disregarded all personal risk and exposure, and manfully plied their frictions and massage wherever their services were available, and doubtless many a victim was rescued by their devotion and exertions. Their numbers, however, were soon thinned out by the fell destroyer, the gallant young Irishman, Launcelot Wolfe, among the number, and the organization ceased to exist.

"The ravages of the epidemic augmented fearfully day by day, and so great was the mortality and so inadequate the facilities for the care of the dead, that corpses remained in the houses for indefinite periods of time. No attempt at regular interments was possible. Men were employed by the authorities to cart away the dead; the bodies were heaped promiscuously in the carts, and the drivers, with a bag of camphor to their noses, rapidly conveyed their human burdens to the cemetery, dumping the loads just within its gate. No physician could drive in his buggy through many of the streets, for the sight of a vehicle of the kind announced his calling, and from every house he sought to pass men and women seized the reins and forced him to enter the house and prescribe for the sick. In these he would find an inmate just prostrated, others in collapse, and more who had passed into eternity.

"The weather throughout the prevalence of the epidemic was damp and misty, the sky overcast by clouds obscuring the sun—a fit shrouding of the city for the desolation and death pervading it in every quarter.

"Beyond a few bereaved mourners, who sought abroad relief from the drug-stores and supplies from the grocers, the streets were almost wholly deserted. Stores and shops were closed, and the only vehicles to be seen were those bearing away the dead.

"When the work of desolation had attained its maximum, somewhere about a week or ten days from the irruption of the epidemic, the panic was at such a height that the city government—animated doubtless by the advice of leading citizens—anxious to dispel from the atmosphere the poison which seemed to lurk in its murky and dismal expanse, ordered cannon to be fired at short intervals at the intersection of the streets in the heart of the city, and barrels of tar to be burned in similar localities throughout the doomed city. Let the imagination dwell for an instant upon the scene of terror awakened by the booming of the cannon, and the lurid heavens lit up by the fires enkindled in hundreds of places, with the columns of black smoke emitted by the burning tar hanging like a funereal pall over the city, and the picture becomes one of the most appalling the mind can conceive. That numbers of the critically sick perished under the shock conveyed by this mistaken effort to dissipate the mantle of the disease in which the city was enwrapped is beyond question; while the timid who were yet unassailed, and who might have escaped, fell under its influence through the terrors of the spectacle they witnessed.

"What pen is equal to a faithful description of the widespread desolation and horrors of the few days during which the cholera prevailed epidemically in New Orleans during its first visitation in 1832?

"A faint idea of them may be conceived when told that the unshrouded dead dumped at the gateway of the Girod Street Cemetery accumulated in such numbers that the entrance to its precincts was so obstructed that arriving bodies had to be deposited on the outside; no graves at this time could be dug; no coffins were procurable, for there were neither grave-diggers to be had or undertakers to be found. The City Council were forced to order out the chain-gang, 'prisoners' from the city jails, to dig a trench the whole length of the lower side of the cemetery. It was dug some twelve or

fifteen feet wide, and as deep as the water-logged soil would permit. Into this receptacle the decomposing bodies were dragged by hooks from the fire companies, without the formality of precedence or order of any kind. As a part of the trench was filled, the earth taken from it was heaped upon the remains of the rich and the poor, the aged and the young.

"One striking incident may be related of the utter impossibility to regard the claims of the exalted to the common decencies of sepulture. The Attorney-General of the State died in the lower part of the city, and laid two days without removal. A friend, the late Charles Gardiner, of this city, obtained a hack, at an enormous price, to carry the remains to God's acre. The driver and himself placed the body in the hack, conveyed it to the Girod Street Cemetery, and left it on the ground amidst the heap of those who had preceded it to that common resting-spot.

"How many similar occurrences could be named! One more, and the veil must be drawn over so sad and painful a picture: The United States Marine Hospital, a portion of which still remains, was situated at the corner of Circus (now Rampart) Street and Poydras Canal, now the Poydras Market. It was under the care of the late Dr. James S. MacFarland. He sickened with cholera, and the resident physician in charge, Dr. George W. Roe, and his assistant both died of the epidemic. The stricken inmates, to the number of thirty or forty, bereft of all care and supervision, died also, and their bodies after several days became so decomposed, that the City Council passed an ordinance to have the hospital burned, with the dead it contained; but the inhabitants residing in the immediate vicinity, fearing that the conflagration might extend to their dwellings, and no fire companies being available to protect them, petitioned the Mayor not to carry the ordinance into execution, they engaging to remove the bodies into the centre of a vacant square, upon a part of which the hospital stood, and there to burn them. This was granted, and the dead were drawn forth by hooks from the fire companies, and a funeral pyre was made of the fencing around the square and the bodies incinerated.

"The cholera prevailed epidemically for about twenty-one days; though, of course, scattering cases continued to manifest

themselves for some time, like the reflex waves which follow a terrible tempest.

"The population of New Orleans at that time was estimated to be about 55,000 souls, and the mortality from the epidemic was computed at something over 6,000, fully a twelfth of the population. It may have been more, for I know personally that a number of bodies were cast into the river, no interment of them being possible, and these probably did not enter into the general estimate.

"How many of the laborers engaged in digging the New Canal in that year perished from cholera I have never positively known, but they were computed at 600. These, too, may not have been included in the record of deaths, as they died in their huts, made upon floating cypress logs and thatched with palmetto, at the point to which the canal had attained. The victims were, for the most part, Pennsylvania Irish, brought out by Mr. Simon Cameron, since a Senator from that State, who was the contractor to make the canal. When assailed by the cholera, these laborers crept into their palmetto huts, with a jug of whiskey, and died. Their bodies were drawn out and buried on the raised pathway of earth thrown up in digging the canal, and remain there still."

This account, resembling in its sad details those given of the ravages of the plague in London and elsewhere, and hardly exceeded by them in many of its features, must be regarded as the legitimate fruit of the total absence of municipal sanitary precautions, as well as domestic hygiene—so little understood at that day—the want of which left the city wholly unprepared to meet the visitation in a way to mitigate its force by wise health regulations and provision of hospital care for the indigent sick; all of which, if wisely instituted and faithfully carried out, would doubtless have shorn the epidemic of its virulence and abated the mortality, as well as begetting a calm and resolute co-operation of all citizens to prevent its spread.

This epidemic (1832) is called, from comparison with succeeding outbreaks of the disease, the "great epidemic of cholera." It left its impress so strongly that during the years 1833, 1834, and 1835 there was a tendency for many cases of disease to assume choleraic symptoms.

It was not until December, 1848, that the United States experienced another importation of the disease. It appeared almost simultaneously at the ports of New York and New Orleans. Professor Alonzo Clark, in a lecture delivered in 1866, says:

"Two ships left Havre, one on October 31st, the other on November 9, 1848. The latter ship, the New York, was bound for the city of New York. The former, the Swanton, was bound for New Orleans. The passengers of these two ships were of the same character, mostly German immigrants; they had been taken up in both instances at Havre, which port was at that time free from cholera. They had come to Havre for the purpose of finding a ship to this country. One report states that a portion of them had left infected places in Germany. The ships came out with a clean bill of health. The New York had been at sea sixteen days when cholera appeared, that is, on November 25th. The Swanton had been at sea twenty-seven days when the first case occurred, it being on November 26th. They were one thousand miles apart; they were both off the coast of the United States, one in latitude 25° 47′ and the other in the parallel 42°. . . .

"The two ships go on this voyage; one arrives in the harbor of New York on December 1st, six days after the outbreak, having lost 7 of her passengers; the other goes into the Mississippi River and up to New Orleans, having lost several of her passengers, reaching the city December 11th."

The Swanton, according to Dr. Marsden, reached New Orleans on December 11th. She had been detained at no quarantine station, proceeded to her wharf, and discharged her passengers. On her arrival one cholera case was sent to the Charity Hospital. The other passengers dispersed themselves throughout the city. During the month of December 400 cholera deaths were reported at New Orleans; in January 600 were reported, and the epidemic culminated in June, 1849, in 2,500 and odd deaths.

The late Dr. E. D. Fenner throws some doubt on the origin of the disease by this special importation, and states that the ship Gutenburg, from Hamburg, having on board two hundred and fifty emigrants, arrived at the port of New Orleans December 6th, after a passage of fifty-five days. Several deaths

from cholera had occurred at sea, and one of the early cases in the city was a man from this vessel.

The disease spread up the river from New Orleans, and was carried throughout the Mississippi Valley.

Cholera existed continuously in Europe from 1847 to 1859, and the disease unquestionably reached the United States repeatedly during this period. "Cholera seemed still to linger about New Orleans and along the Mississippi River, occasionally amounting to a moderate epidemic in the city and on some of the plantations along the coast."

It is known that ships arrived at New Orleans during 1853, and the early months of 1854, which had experienced cholera at sea. I am unable at present to obtain full data regarding the extent the disease prevailed, but it has been intimated that during one week, in 1854, 200 deaths occurred. The disease prevailed during the summer of 1854, but was lost sight of in the epidemic of yellow fever which prevailed later in the season. The records show 352 deaths to have occurred in the Charity Hospital alone; 585 deaths are recorded as having occurred in New Orleans in 1853.

Cholera prevailed extensively in Europe in 1865, and its march from China has been definitely traced.

Cholera prevailed in New York in 1865 and 1866, having been imported on a number of vessels; but the disease did not assume the extensive horrors of previous epidemics. Its appearance in New Orleans, if not traced to troops arriving from New York, at least shows that its dissemination through this agency was extensive. It prevailed at Forts Jackson and St. Philip, Ship Island, Baton Rouge, and Shreveport among the United States forces, and also in Galveston, Tex. The deaths from cholera recorded in New Orleans in 1866 amounted to 1,294; in 1867 to 581.

It was not until 1873 that the cholera again appeared in the United States, and the first recorded case was at New Orleans, on February 9th. The disease appeared in a mild form, and for some time the physicians refused to believe that the dreaded disease had again appeared. The greatest number of deaths occurred in May, when 125 deaths are recorded. The total number of deaths from cholera in the city during the year was 259.

The most searching investigation failed to develop any positive facts regarding its introduction. It is known, however, that quarantine regulations amounted to mere inspection and the recording of answers given by ships' officers. No vessels were fumigated. Large numbers of emigrants arrived and diffused themselves throughout the city, and the first recorded death was in the person of Peter Thompson, who, after unloading a ship from Liverpool, contracted the disease.

A work has recently emanated from the Department of State recording the reports of American Consuls regarding outbreaks of

CHOLERA IN EUROPE IN 1884,

and the sanitary, quarantine, and other precautions taken by local and general governments looking to the suppression of the plague. The work is full of valuable data, and the report of Consul Frank H. Mason, at Marseilles, is especially worthy of consideration. He, with good reason, attributes the epidemic to importation from Saigon, China, by the French transport Sarthe, to the town of Toulon, and its extension from Toulon to Marseilles and other ports.

He draws attention to the great danger from the early return of fugitives, and also to the mortality among the better classes, and the inhabitants of "narrow, noisome streets lined by swarming tenements, that the Asiatic scourge mainly attacks." . . .

"A careful study of all attainable facts of this kind would seem to show that the ignition and spread of cholera in a community is

"FAVORED BY FOUR FUNDAMENTAL PRINCIPLES, VIZ.:

"1. Porosity of the soil, which would allow choleraic dejections to penetrate to sufficient depth to reach springs, wells, or other sources or channels of water used for domestic purposes. Open, gravelly soils are therefore the worst in this respect.

"2. The facilities offered by drains, sewers, and watercourses for the circulation of infected water under or among the dwellings of a village or city.

"3. The accumulation of fæcal or other decaying organic matter infected by choleraic dejections.

"4. Close, crowded, ill-ventilated dwellings, combined with unwholesome and irregular alimentation, and neglect of cleanliness."

The report from which these extracts are made speaks of the various quarantines established at ports; but this agent of protection is illogical and indefinite, as detention is the main feature, and the purifying process neither systematic nor complete. It is not surprising that they have failed to ward off danger. As long as cholera prevails in Europe it is

A PERPETUAL MENACE TO THE UNITED STATES.

The experience of past epidemics should teach a lesson regarding timely efforts to combat its introduction, and, in case of its appearance, to prepare ourselves to meet the emergency. History has shown its severity in foul, crowded precincts, and, aside from quarantine measures, every effort should be bent to put our city in the best sanitary condition for repelling cholera.

The present system of quarantine at the mouth of the Mississippi River bears about the same relation to the usual quarantines of to-day that the flint-lock musket does to the most improved breech-loading rifle. Indeed, the system of "maritime sanitation" instituted by the present Board of Health of the State of Louisiana should not be known by the barbarous term quarantine. The vessel surcharged with disinfecting gas, every available part washed down with the most powerful germicidal agent known, the thorough inspection of log, and the most rigid accountability demanded on the part of ship officers; in fact, every precaution which science can advance, coupled with zealous and efficient officers to perform this work, renders liability to the introduction of any infectious disease less than is afforded at any known port where quarantine measures are instituted, and no pains will be spared to render it more effective. But so many avenues of entrance are available, and the spread of the disease in many instances so rapid, the consideration of sanitary methods to be inaugurated before its entry or during its progress demand attention and must be appreciated.

The first and most urgent demand is, then, that

MUNICIPAL SANITATION

be prosecuted to an extent commensurate with its importance. Every house and yard should be repeatedly inspected.

Tenement-houses should be vacated, or the number of inhabitants reduced, so as to warrant air-space sufficient for health and comfort.

Stagnant water should be removed, and drainage under houses insisted upon.

All wells used for drinking or culinary purposes should be closed.

The streets perpendicular to the river should be placed in the best possible condition to receive flushing water.

The navigation canals should be made to flush the reservoir canals in the rear of the city, and adequate drainage machinery introduced to rapidly displace the accumulating water.

All vaults should be frequently disinfected, and emptied of their contents when occasion demands.

All nuisances which are forbidding to the senses or jeopardizing to health should be removed through active sanitary agents, employed for known zeal and ability, and disinfectants applied to all drains, gutters, and places where moisture and putrefaction are liable to occur.

In no disease are the lessons taught by hygiene of more value than in Asiatic cholera, and, while municipal sanitation is being carried on, personal care should be brought into play by every citizen. A pleasing exterior often hides causes of sickness and death, and erroneous views in regard to proper care to be exercised begets a false sense of security.

Could the people but be educated to a proper appreciation of the dangers consequent upon the bad condition of their homes, and thus personal responsibility for sanitary neglect known, how much good could be accomplished, not only in warding off cholera, but in preventing many diseases which give New Orleans her unfortunate status regarding health!

In regard to personal hygiene, artificial stimulants producing subsequent depression should be avoided.

Regular but not too frequent baths are recommended.

Wholesome food and regular habits contribute to immunity from the disease.

Fear, and its liability to cause excesses, is considered, by

writers on the present epidemic, to play no unimportant part in lowering vitality and rendering the individual more susceptible to the poison.

Water for drinking or cooking purposes should never be used during a cholera epidemic, if there is the least danger of it having become contaminated, without previous boiling.

Isolation of cases is essential.

Soiled clothing and dejections should be submitted to disinfection with a solution of bichloride of mercury or solution of sulphate of zinc and common salt. Submission of soiled articles to dry heat of 250° F. will destroy the poison, but ultimate sanitation of infected articles by fire is wisest.

All privy vaults should be disinfected with bichloride of mercury and frequent applications of solution of copperas.

Infected rooms should be disinfected with sulphurous acid gas.

Dead bodies should be disinfected, and early burial insisted upon.

All public assemblies should be forbidden by ordinance.

Interments should be private.

Intramural interments should be prohibited.

Incineration recommended.

One violation of sanitary law should be prohibited by statute, viz.: The custom indulged in by washerwomen of the city of carrying soiled clothing in the street-cars.

Finally, citizens should have impressed upon themselves the imperative necessity of having treated at once any early symptoms indicative of disturbance of the digestive system, as fully one-half of all cases of cholera are manifested by such disturbances hours before the disease becomes virulent.

THE ORIGIN OF CHOLERA IN TOULON IN 1884.—Dr. Paine, of Cardiff, in a paper read before the recent meeting of the British Medical Association, gave in his adhesion to the germ theory of the disease. "It is," he said, "a specific organism which causes cholera, which may continue latent for a long period, as exemplified in the origin of the cholera in Toulon last year, from stores in an old hulk that had lain by since the Crimean War, in 1854."

RAGS,

A National and International Danger.*

By Ruijsch, of the Hague.

In fact, numerous have been the persons raising the cry of warning against the germs of pestilential diseases, that go around the world in infected linen and rags, from the time when Pacini, in the *Gazetta Medica Italiana*, considered bacteria as the essential principle of the contagion of cholera, and since the Constantinople International Congress stated that the dejections of cholera patients are real storehouses of the germs of the disease, and that every object infected in this way, may become, under circumstances favorable to the development of the germs, a true focus of infection.

Richter, Wildtbeck, Bech, Reclam, Lewis, Robinson, Fauvel, Gibert, Gaffky, Vallin, Finkelnberg, Schlemmer, Reitböck and others have asked for precautionary measures against the danger of rags, but their voice was the "*vox clamantis in deserto*," and although discussed at the Congress of Turin and Brussels, the solution is to come yet, and the means of preventing the evil are still failing us.

Alas, in this case as in many others, when the question is to put in practice some prophylactic measures, the interests of hygiene and industry are not all alike, at least so long as those measures are not carried on at the same time in all countries.

If in any country, for the sake of public hygiene, some restrictions are put on certain kinds of business, they will surely meet with opposition from the men engaged in it. I have had myself a proof of it, when I called the Government and my colleagues' attention to the danger arising from infected rags, when I was then accused of exaggerating the danger and proclaiming authoritative and vexatious measures inspired by foolhardy doctrines, not reaching the aim they were intended

* Abstract of a paper read before the Fifth International Congress of Hygiene, at the Hague, 1884. Translated for The Sanitarian.

to, and producing no other result but injury to the paper trade and bitter deceptions to merchants.

Well, notwithstanding this lugubrious prediction, I shall again take the liberty to put up the rag question to the order of the day, well knowing that the arguments against it will be forthcoming before long.

Let us first examine the amount of danger there is in infected rags, old clothes, linen, and wearing apparel.

When, commencing our inquest, we consult the annals of the Medical Inspection of Netherlands since 1865, we find a long array of facts, alas, too long! stated by the Medical Inspectors, that show that in Holland also, rags and old garments have had a large influence in propagating contagious diseases; and this notwithstanding that the Low Countries have a law against epidemics, that forbids "to convey or cause to convey, to give as a gift or for use, to cause to give, to sell or cause to sell objects that have been in contact with or used by persons sick or diseased from Asiatic cholera, typhus, small-pox, scarlet fever, measles, diphtheria, and dysentery, punishing transgressors with a fine of five to twenty-five florins, and imprisonment from one to three days."

We have in our country two reports that give very good information on the subject. These are the reports published by the Minister of the Interior, relating to the last small-pox and cholera epidemics that were prevailing in the Low Countries during the years 1866–67 and 1870–73.

There are to be found all the circumstances that, according to the inspectors and practising doctors, have had an influence on the origin and the propagation of infectious diseases.

Naturally the proverb "*errare humanum est*" is applicable here as everywhere; here chiefly where the man of science is treading upon the ground not very smooth yet and semiopacous of the origin of infection and the etiology of infectious diseases, perhaps the most interesting of all in hygiene, but also the most difficult, and, let us add, deceptive at the same time.

I say this, because I do not want to be accused of not having consented to our not being infallible, and that when we fix our attention to a certain fact, as, for example, to the fact that several times girls who were handling rags partly proceeding from infected localities, have been stricken down with small-

pox, whereas no other case of small-pox was discovered in the city where the paper factory is, we are not able yet to designate the microbe so as to show its local origin proven by a seal and passport of the Burgomaster from the place whence it came, but, because we have the right, however, to suspect very seriously rags as being the origin of the disease.

But, let us pass to the facts in question: In 1868, various men working in a paper mill at Wormerveer had been handling rags from infected origin and were taken with typhus.

In 1870, the first cases of small-pox that appeared at Breda were among persons who had been washing infected clothing from a small-pox patient, coming from an infected district.

In 1870, 1881, and 1882 the same thing happened at Utrecht.

In 1873, a pillow infected by a small-pox patient caused several cases of small-pox to appear at Goreem, while in that same year a rag-picker's daughter was attacked after having bought some rags from a person who had had small-pox, and caused also a new epidemic to break out.

The appearance of the disease at Ohé and Laak, and at Olkmaar, was also due to the importation of infected clothes from infected localities in Belgium and at the Hague.

The origin of the small-pox epidemic in 1871 at Heerde and Epe, the medical inspector attributed to rags.

In that same year Schyndell and Rozenburg were invaded with small-pox by the importation of infected clothes from Schiedam.

The cases of small-pox that broke out in 1873 in the hospital at Utrecht were traced to insufficiently disinfected bed-quilts which had been infected by small-pox patients treated there in 1872.

The same origin is given to the Tilburg epidemic in 1873.

In 1870 and 1880 consecutively were attacked with small-pox persons who, while working in a paper factory at Maestricht, had been handling rags or had visited the locality where rags are selected, whereas during all that time no other case of the disease was known in Maestricht, but only in Belgium, whence the suspected rags were partly coming.

In 1880 a dealer in rags conveyed small-pox from Rozindaal to Vouw.

In 1881 the infected rags from Gouda caused an epidemic at Barendrecht, etc., etc.

It would be a waste of time to recite all the cases where rags and infected linen have brought on epidemics. One more, however, let us recall; I speak of the small-pox epidemic in 1871 at the little town of Muiden, brought in by a man who, in the last days of December, 1870, after he had buried his daughter, who had died of small-pox at The Hague, took and gave her wearing apparel to his other three daughters at Muiden; well, they all died in January, 1871, from the disease, and caused an epidemic in Muiden that carried off fifty people.

And when we look at the report on cholera, we are amazed to see that its origin and propagation are always traced to the influence of clothing, dresses, and the traffic in old garments and rags.

Thus, a rag-picker from Amsterdam, where cholera was raging, introduced it into the city of Tilburg in 1866 in a truck-load of infected clothes.

At Druten, a rag-picker was the first victim in that commune.

At Mearssen, the first one attacked with cholera was a rag-man.

Again, at Heusde, Oudenbosch, Hindelopen, Nieusisburg, Leeuwarden, and Bois-le-Duc, cholera was propagated by the handling and washing of old clothes, clothing, and bed-clothing, etc.

In England, France, Germany, etc., the same facts go to prove the propagation of diseases, and principally of small-pox. One of the most interesting works on this subject is certainly Doctor Gibert's report on the epidemic at Marseilles, that had exactly the same characteristics as the small-pox epidemic of 1874 and 1875, and proved beyond doubt the great influence of rags on epidemics. So, to cite only two facts, in 1874 there were 117 rag stores in Marseilles, of which 46 were in one district. In that district the number of deaths from small-pox was three times larger than in any other district, while of 157 cases of death 64 occurred in rag-pickers' houses or in houses in close proximity to rag-pickers or rag stores. In that district Gibert found a cellar, a secret store-room for rags, which infected six persons, of which four died.

Dr. Lewis, from Watertown, Mass., gave evidence that infected rags from California caused several epidemics among workmen in a paper-mill, as, for instance, in 1875, when, in one day, seven women rag-pickers were attacked with small-pox, which in a few days communicated to forty people in that factory, thirteen of whom died.

In that same year, Dr. Roberson noticed at Canterbury an epidemic introduced by three women who had been handling infected rags.

Infected rags from Marseilles have caused, in 1880, a small-pox epidemic at Abenheine in Germany, infecting five women.

Similar reports on the propagation of small-pox by means of rags have been established in a paper-mill in the Canton of Zurich in 1881, in Michigan in 1882, at Lyons, Christiania, Leipsic, Breadfort, Osselt, Whittlesford, Thetsort, etc.

To make it shorter now, I pass by that peculiar disease ragmen are subject to, called "Hadernkrankheit" (rag-pickers' disease).

Let us remember also, that abroad various infectious epidemics, other than small-pox, were discovered and traced to rags or infected linen, as, for example, the plague that, according to Richter, was introduced at Bongazy, in Mesopotamia, by cases of rags, and the cholera epidemic that, according to Prof. Droschke, made its victims among the washerwomen and laundresses of Dornbacher-buanderie, at Vienna, of whom seven died from cholera after washing infected clothing from cholera patients, however not numerous at the time in the Vienna hospitals; also, the cholera epidemic that was raging at Marseilles, in the district densely populated with rag-pickers. Finally, actual facts confirm our assertions.

While Koch in Egypt and on the Ganges stated, that on various occasions cholera had been propagated by means of infected water, clothing still wet from cholera patients, and while in his filth letter from Calcutta, dated March 4, he says:

"It is a fact, that the water in the washtubs has been infected from washings from cholera patients, which, by former observations, contain the cholera bacilli in large quantities." If we look on the southern part of France, or at Silesia, the same facts are to be observed. In the neighborhood of Nîmes

we see a man from Gige, who, after he had lost his wife from the disease, starts with her linen and dresses to sell them at the city of Cette, afraid that the authorities might confiscate them. But on his way he falls a victim to his own imprudence, and dies by his infected clothing. Cholera was introduced into Aspet (Upper Garonne) by infected clothes from Marseilles. Petechial typhus was introduced into Frineck, and from there to several other localities in Silesia, by means of old garments worn by people who had died from typhus.

Anyway, even leaving out these last observations, it is clear that objects with a high absorbing power, that receive from the body so many excretions, like perspiration, the cells perhaps diseased with the epidemic, bacteria, etc., that are besides several times wetted, when handled are very apt to carry with them the germs of contagious diseases and become nests of microbes.

Cellars and stores where rags are warehoused, are, above all, a source of danger. To this danger attention had been called already by Richter and Emil Beck; only a few days ago Dr. Krzeczka sounded the note of warning at a private lecture given in Berlin to the princes of science.

In 1867 Mr. Richter said: "The keeping of old clothes, beds, upholstered furniture, and rags in the interior of populated cities is to be considered as the centre of contagious diseases, and real pest-holes." And this is but too true.

What better medium for the development and multiplication of microbes than those ill-ventilated, warm and wet rooms, where rags are generally put in? In 1877, already, Blunt and Douwes discovered that the rays of the sun hurt the development of those redoubtable germs, and Tyndall experimenting with two bottles of infected liquid, the one left in the dark and the other exposed to the light, has shown us darkness to be the precious ally of microbes. Finally, the experiments of Pasteur, Koch, Vacher, Wolfhügel and Quist, of Helsingfors, have demonstrated conclusively how the combined influence of heat and humidity is favorable to microbes.

There is no doubt that stores where rags are kept are dangerous in densely populated centres. Also, Hesse has proved that the air in the localities where rags are handled and treated

is saturated with dangerous micro-organisms. We must also call attention here to the danger of spontaneous combustion of rags, which at various times has caused great fires, and perhaps at Amsterdam, Rotterdam and Rumemonde lately, some conflagrations originated in this way. This is one more reason for prohibiting the keeping of rags in large centres of population.

Let us remark here that not only the stores but all the places where rags have been in transit must be watched carefully, from the truck that takes them to the place where they are to be selected, till they have reached the paper-mill; and this watch must be ceaseless, at least as long as disinfection is not generally practised according to the rules of science. And it will take some time yet.

We Dutchmen have a law that renders the disinfection of rags obligatory, but disinfection is not always effective, and the part that infected garments have in the propagation of infectious diseases is still very large. However, I would like to say that, although in our country domiciliary disinfection is not perfect, my conviction is that epidemics have been prevented by a rigorous disinfection, when practised according to the rules prescribed by the law of December 4, 1872.

Besides, even if disinfection fails sometimes (who can foresee everything?) we must by all possible means make it our duty to secure disinfection.

This aim to reach, we must have in every commune a disinfecting station; say for a large commune a complete station, like in London, Liverpool and Leipsic, with boilers as per Schimmell's pattern, or others; or, for a small commune, a small disinfecting apparatus, by means of steam or hot air, as the Bacon, Maguire, Janssen, Gilbert, etc., boilers.

As to disinfecting rags in a lump, I fear it to be a difficult matter. The compact mass and enormous quantity to be disinfected renders the operation difficult and expensive, besides, the destruction of microbes cannot always be calculated upon with mathematical precision.

When we are face to face with known contagious disease it is possible to tell how to achieve perfect disinfection; but when we have large bales of rags that may proceed from places where plague, cholera, small-pox, etc., were raging,

diseases whose means of killing the microbes by disinfection are all easy enough, but often very different, what then is to be done? What kind of disinfection must we prefer?

Is it necessary to expose the infected garments, mattresses, etc., to the air, in a place hot or dry, free from rain, as this would suffice for cholera, or is it necessary to expose the contaminated objects to the iodic vapor in order to kill the Mucor Cholérifère of Milles? Is it enough if a temperature of 80° C., that kills the bacteria of vaccination, or must the whole mass, piece by piece, be subjected to superheated steam to kill the bacilli of the carbuncle?

Disinfection is still difficult, even when we know what kind of germs are to be destroyed; but what are we to do where different germs of disease are to be exterminated, and nobody can tell yet whether wet heat is better than dry heat, or if to use in preference Salts of Mercury, oxygenated water, fumigation of Chlorine, Bromine, Iodine, or weaker means of disinfection?

I know that many here present think superheated steam the best process for disinfecting rags in bulk, and believe it to be very practicable; that the experiments of Dr. Parson have proved that a ton of rags can be disinfected at a cost of one franc and four cents by steam at 121° to 128° C., without injuring the goods; that Dr. Buchanan has said that a two hours' exposure of the rags at 121° C. was sufficient; that Washington Lyons' apparatus, as well as Gilbert's boilers and others, have been very useful for the disinfection of rags. However, I believe, for the above-mentioned reasons, the disinfection of rags in bulk is pretty difficult.

For myself, to all others I prefer the surrounding of this dangerous stuff with hygienic precautions, and to follow it up closely from the death-bed of the patient or the pedler's box to the store where they commence to accumulate this refuse, and then from the warehouse to the paper-mill, or place where the selection of rags is made.

I would, moreover, like to see the international transportation of rags regulated in such a manner that bales proceeding from infected countries and refused admittance, say, for instance, by the Board of Health of Liverpool, could not be sent to Rotterdam, Antwerp, or Bordeaux, etc., etc., or rather

that the exportation of rags from infected countries was absolutely prohibited.

Dangerous matter must be watched everywhere, since commercial interests do not always agree with public hygiene; it is a hard problem to solve, because commerce as well as hygiene is an important factor in the welfare of a community, and cannot be separated from public health.

And the interests, commercial and social, of the rag trade are not to be overlooked. Only in France some 224,860 people make a living out of rags, according to *l'Economiste*, and *La Nature* puts at 2,000 the number of Italians in New York who live on that refuse of civilization.

And who does not remember the excitement that was created last year in Paris on account of rag-pickers? It taught a lesson of prudence in disposing of this refuse, as it must be disposed of in as systematic a process as other kinds of refuse, looking as well to the injury that may result as to the utility derived, as in filth.

As in the disposition of filth we must commence by watching the place, the gutter near the house it came from, the sewer under our feet, and finally the point where it is accumulated; so in rags must we watch the various ways by which they come into circulation, and the stations where they are heaped, and so much more so in rags, as we know by a sad experience that men engaged in this business for the sake of a few pennies are often apt to relax their vigilance.

Richter, one of the first to raise the cry of alarm against infected rags, has remarked very fitly on this subject: "When a man's own interests are at stake he does not care at all for his fellow-beings, whether in adversity or prosperity, and for a farthing he will put all the people's health and lives in jeopardy."

Therefore it is our duty to caution the public and to take our precautions against the danger of rags. To remain inactive in this matter, or to be intimidated by the pamphlets of some eager and unscrupulous dealers interested in the rag trade, would be cowardice.

Even at the risk of being accused again, as we have been before, of the monomania common to young doctors of seeing germs of disease everywhere, bacteria here and there, in the air, in the water, in garments, and in the houses, etc.; even if

the public has been made to disbelieve our foolhardy doctrines of the infection resulting from rags which have been invented only to embarrass paper-dealers; even at the risk of seeing our reputation ridiculed, it is our most imperative duty to warn the people against the danger of rags.

RAILWAY SANITATION.

AMONG the matters of importance to the public in regard to general sanitation, and of special interest to our profession as custodians of the public health, are the questions, What can be done by our railroad companies, not only for the health of their employees, but to secure that their buildings and rolling-stock shall be kept in a thoroughly sanitary condition? and then, What are they doing?

For some time past the Missouri Pacific Railway system has made provision for the efficient and skilful treatment of employees who are injured or become sick in its service, by the establishment and maintenace of a large hospital well situated and with abundant room, and with the greatest facilities for giving those who are entitled to it the very best care that is possible.

Similar arrangements have been made by the Wabash system, although that organization has not established a large hospital here. The surgeons of that company have formed a medical society and hold regular meetings, at which papers are read and discussed on such topics as are of special interest to them.

Another step has just been taken by the Missouri Pacific system. A circular has just been issued by Vice-President Hoxie, in which is expressed the desire of the managers to place the property of the companies comprised in this system in good sanitary condition, and attention is called at the same time to the importance of such measure to the welfare and prosperity of the employees. The managers express their intention of hearty co-operation with all State and local boards of health with which they may come in contact, and enjoin similar hearty co-operation upon all concerned.

Dr. W. B. Outten, chief surgeon, is placed in charge of all matters pertaining to the sanitary interest of the roads, and all officers and employees are instructed to carry out any rules and directions that may be issued by him. Sanitarians in the East and West will await with interest the publication of Dr. Outten's rules and directions, as the subject of railway sanitation is almost a new one, and the chief surgeon of a system that operates over six thousand miles of track through such a country as that in which these roads lie has an opportunity and a responsibility such as fall to but few men.—*New York Medical Journal.*

LIFE INSURANCE.—America, always believing that what has been done by others she can do, and better it every time, is pleased at this era in her history to have the opportunity to look across the water to her distinguished mother, and smilingly say that, with only one-third as many companies, and they only one-half as old, she has almost as much business. She has demonstrated her ability to successfully plant, and nurture, and reap. Her experimental days are past. She realizes that it is an age of specialties, and that men must *know* before they can *do*. She has the men who know, and therefore she is doing. And what *has* she done? Planted two billions of the best assurance in the world for the future protection of one million of her families; paid $1,000,000,000,000 in death-claims, endowments, dividends, and the purchase of policies before they were due, to no less than four hundred thousand other families; holds now $500,000,000 of well-invested securities as the legal requirement of the future, and has reached an income of $100,000,000 per annum, while the new business is over $1,000,000 per day in the year.—DAVID N. HOLWAY, in *Insurance Monitor.*

HORSFORD'S ACID PHOSPHATE is a form of administering phosphorus well calculated to secure its most beneficial results in diseases incidental to nervous exhaustion from a variety of causes.

SANITARY ENGINEERING.

AT the last meeting of the Board of Trustees of Columbia College, held on Monday, June 1, 1885, it was

Resolved, That there be instituted in the School of Mines a course of instruction in Sanitary Engineering, in accordance with a scheme to be approved by the President and the Committee on the School of Mines, to commence at the resumption of exercises in the School in October, 1885, and to be completed in four years.

Resolved, That students who shall faithfully pursue the course in Sanitary Engineering provided for in the foregoing resolution shall, on passing an approved examination upon the same, and upon recommendation of the Faculty of the School, be entitled to receive the degree of SANITARY ENGINEER.

REQUIREMENTS FOR ADMISSION.

Candidates for admission to the first class, at its formation, must be of the age of seventeen years, complete; and for admission to advanced standing there will be required a corresponding increase of age.

Candidates for the first class must pass a satisfactory examination in Arithmetic, including the metric system of weights and measures; in Algebra, on the first ten chapters of Peck's Manual of Algebra; in Geometry, on the first six books of Davies's Legendre; in Physics, on the equivalent of Ganot's smaller treatise (Peck's Ganot's Natural Philosophy); in French, on the general principles of French grammar, including an ability to read Montmahou's Cours d'Histoire Naturelle, or its equivalent; in German, on the general principles of German grammar, including an ability to read Hans Andersen's Märchen, or its equivalent; in English grammar, on the equivalent of Quackenbos's English Grammar; in Composition and Rhetoric, on the equivalent of Quackenbos's Course of Composition and Rhetoric; in History, on the equivalent of Thompson's History of England and Doyle's History of the United States,

as contained in Freeman's Historical Course for Schools; in Physical Geography, on the equivalent of Guyot's Physical Geography; and in Free-hand Drawing, including the ability to sketch, both in outline and with proper shading, ordinary objects, such as a tree, a house, a simple piece of machinery, a piece of flat ornament from a copy, a group of geometrical solids, etc. An applicant may, at the appointed entrance examinations of one year, be examined in portions of the above subjects that are *complete* in themselves—*e.g.*, arithmetic, algebra, or geometry, composition and rhetoric, English grammar, history, etc.—and finish his examinations in the requirements for admission at the entrance examinations of the year following.

After January 1, 1886, applicants for admission to the first class will be further required to pass a satisfactory examination on the chemistry of the non-metallic elements, equivalent to what is contained between pages 134 and 312 in Watts's Manual of Chemistry.

Candidates for advanced standing must pass a satisfactory examination upon the studies named above, and also upon those pursued by the class which they propose to enter.

Candidates for admission after the opening of a term will be required to pass satisfactory examinations on the part of the course already gone over by the class for which they are applicants.

No candidates are admitted later in the course than the beginning of the third year.

Graduates and students of colleges and schools of science, who shall have completed so much of the course as shall be equivalent to the requirements for admission, may be admitted at the beginning of the second year, or earlier, without examination, on presenting diplomas or certificates of good standing and honorable dismissal satisfactory to the examining officers.

The regular examinations for admission are held annually, beginning on the Friday before Commencement, and on the Tuesday preceding the first Monday in October. Candidates will, however, be examined during the session, but not in vacation.

TEMPERANCE EDUCATION—WHAT IT MEANS.

AS many inquiries have been made as to the duties of school committees and teachers under the temperance law in Massachusetts (substantially the same as the recent laws of several other States on the same subject), the subjoined opinion of the Hon. Judge Wells—a member of the Massachusetts Senate of 1885—to whose efforts the friends of this legislation are largely indebted for the statute in its present form, is of interest in interpreting the law:

AN ACT REQUIRING PHYSIOLOGY AND HYGIENE TO BE TAUGHT IN THE PUBLIC SCHOOLS.

SECTION 1. Physiology and hygiene, which, in both divisions of the subject, shall include special instruction as to the effects of alcoholic drinks, stimulants, and narcotics on the human system, shall be taught as a regular branch of study to all pupils in all schools supported wholly or in part by public money, except special schools maintained solely for instruction in particular branches, such as drawing, mechanics, art, and like studies. All acts or parts of acts relating to the qualifications of teachers in the public schools shall apply to the branch of study prescribed in this act.

SEC. 2. All penalties now fixed for neglect to provide instruction in the branches of study now prescribed by law shall apply to the branch of study prescribed in section one.

SEC. 3. This act shall take effect on the first day of August, in the year eighteen hundred and eighty-five.

1. The object of this statute is to provide for, and secure, physiological temperance instruction in the public schools of this Commonwealth.

Physiology and hygiene is a mere method of accomplishing this result. *The Physiological "effects of alcoholic drinks, stimulants, and narcotics"* is the predominant and "special" instruction here demanded.

2. The law further requires that "in *both divisions of the subject*" of "Physiology and Hygiene" "the effects of alcoholic drinks, stimulants, and narcotics shall be taught." The

meaning here is, that as the pupil is taught physiology, or about the structure and organs of the human body, in the same connection he must be "specially" taught "the effects of alcoholic drinks, stimulants, and narcotics" on those organs; and as he studies "hygiene," or the laws of health, he must in the same connection learn, "especially," the relation of alcoholic drinks, stimulants, and narcotics to those laws.

3. The law further specifies that this shall be taught as "a regular branch of study." "*A regular branch*," under our school system, is clearly a study which the law requires to be taught, and therefore is regularly found in the public schools. This subject, then, must be taught as other like mandatory studies are taught. If, in any public school, arithmetic, grammar, geography, and history (like mandatory studies) are taught, with text-books in the hands of pupils, this study, in such a school, must be taught with text-books in like manner. But if the said studies are taught orally in any school, this study, in such schools, may be taught in the same way.

4. Again, this branch is not only required in "all public schools," but the law requires it to be taught to "*all pupils* in schools" *of all grades*, and must in all cases be taught as other regular branches are there taught.

For example. *In a school where geography, grammar, history, and arithmetic are taught with text-books in the hands of pupils, it would not be compliance with this law to teach this study orally.*

5. It is the aim of this statute that physiology and hygiene, with special reference to the effects of alcoholic drinks, stimulants, and narcotics upon the human system, shall be taught *as thoroughly and as systematically* as other like mandatory studies are taught.

Text-books on physiology and hygiene which give limited, not special, instruction as to the "effects of alcoholic drinks, stimulants, and narcotics upon the human system," or which put that instruction in an appendix at the end of the book, do not make such an arrangement of the subject as is required by this statute, and are not such books as school committees are justified in prescribing or teachers in using.—*Journal of Education.*

EDITOR'S TABLE.

RAGS AND CHOLERA.

JUST after THE SANITARIAN for August had gone to press, our attention was called to a letter in *The Tribune* under this title, which we deemed of sufficient importance to the public to merit the following prompt reply:

To the Editor of the Tribune:

SIR—My attention has just been called to a communication under the title of "Rags and Cholera," in *The Tribune* of the 24th inst., so misleading and so fraught with danger that I am constrained to ask you, out of regard for the public health, the privilege of refuting it before the same readers. I am the more inclined to make this request of *The Tribune* because of its prompt aid a few months ago in publishing my opinion before the Grand Jury of Kings County for the removal of the rag-disinfecting depot from Baltic Stores to a less dangerous place.

In the present attitude of both cholera and small-pox, neither of which diseases is limited by cold weather, the subject under discussion is an exceedingly important one to the public, and worthy of the gravest consideration. Your correspondent in behalf of the paper manufacturers, Adam Ramage, of Holyoke, Mass., would not only have people believe there is no danger of communicating cholera or other infectious diseases by means of old rags, but he would persuade them that rag-pickers and other persons engaged in handling such merchandise are peculiarly exempt from infectious diseases of all kinds, on the same kind of testimony that some plumbers adduce against any danger from sewer-gas, because the singularly competent observers of disease who follow that occupation have never detected a case of typhoid fever among themselves. And in substantiation of this opinion Mr. Ramage ventures on a review of cholera in 1832:

When the cholera fairly raged through England, no case occurred in the Wyecombe Valley, where many thousand people lived, and where also there were, and still are, many paper-mills. In 1866, when we had the cholera in this country, no restrictions were placed on the domestic rag trade, yet there was not only no infection from rags, but no case of cholera occurred at any of the paper-mills.

Holyoke, we are told, now has 30,000 inhabitants, 1,200 of them engaged in handling rags, "remarkably free from contagious diseases, . . . due to the fact that a large quantity of chlorine is employed in the process of preparing these rags for manufacture of paper." How much chlorine, according to Mr. Ramage's estimate, constitutes "a large quantity" is a matter of conjecture, but persons practically familiar with it as a disinfectant know that when it is applied to such material in sufficient strength to be efficacious it is thoroughly destructive of fabric as well as disease germs. But this want of knowledge on the part of Mr. Ramage in regard to the use of chlorine is perfectly consistent with his limited range of observation in other respects. Even Holyoke was not always as populous as it now is, and, according to an official document before us, not by any means as exempt from infectious disease *by rags* as Mr. Ramage would have us believe it always is. According to the Massachusetts State Board of Health Report for 1873, pp. 468-469, in obedience to a legislative order of January 21st of the same year, there is a summary of the cases of small-pox in Massachusetts in 1872 and the first month of 1873, together with the supposed cause of the appearance of the disease in each town. It is shown that 6,108 cases were reported from 197 cities and towns, and the only article of merchandise, save one, to which the source of infection was traced was paper-rags—held accountable for 212 cases. And, singularly as it may seem in the face of Mr. Ramage's statement, 40 cases (including South Hadley, 8) were so caused in Holyoke—the largest number from this cause in any town in the State. From the same cause there were in Adams, 34; Fitchburg, 25; Cummington, 19; Dighton, 17; Lee, 15; West Springfield, 16; Blackstone, 10; and in various other towns from one to six. The exceptional case of other merchandise was an emigrant vessel, 18 cases. But this, like Holyoke in other respects, is

but "a drop in the bucket" in comparison with the number of lives which have been lost in other places by free trade in infected rags.

From a paper on rags by Ruijsch, of Holland, read before the Fifth International Congress of Hygiene, at The Hague, 1884, I extract the following:

In 1873, a pillow infected by a small-pox patient caused several cases of small-pox to appear at Goreen, while in that same year a rag-picker's daughter was attacked, after having bought some rags from a person who had small-pox, and caused also a new epidemic to break out.

The origin of a small-pox epidemic, in 1871, at Heerde and Epes, the medical inspector attributed to rags.

In 1870 and 1880, consecutively, were attacked with small-pox persons who, while working in a paper-factory at Maestricht, had been handling rags, or had visited the locality where rags are selected.

In 1880, a dealer in rags conveyed small-pox from Rozeindaal to Vouw.

In 1881, the infected rags from Gouda caused an epidemic at Barendrecht.

After enumerating several other epidemics of small-pox caused by rags, the author of this paper remarks:

It would be a waste of time to recite all the cases where rags and infected linen have brought epidemics. And when we look at the report on cholera, we are amazed to see that its origin and propagation are always traced to the influence of clothing, dresses, and the traffic in old garments and rags.

Thus, a rag-picker from Amsterdam, where cholera was raging, introduced it into the city of Tilburg, in 1866, in a truck-load of infected clothes.

At Druten, a rag-picker was the first victim in that commune.

At Mearssen, the first one attacked with cholera was a rag-man.

In England, France, Germany, etc., the same facts go to prove the propagation of diseases, and principally small-pox. . . . In 1874 there were 117 rag-stores in Marseilles, of which 46 were in one district. In that district the number of dead from small-pox was three times larger than in any other district, while in 157 cases of death 64 occurred in rag-pickers' houses, or in houses in close proximity to rag-pickers or rag-stores.*

*See Ruijsch's paper on other pages of this number.

It would be an easy matter to extend this category by adding a number of epidemics reported in *The National Board of Health Bulletin*, 1880–81, both abroad and at home; and of others that have been reported from time to time in medical journals. For example: An epidemic at Watertown, N. Y., in 1875, forty cases of small-pox, caused by exposure to twenty bales of rags brought from California. "Sorted by twenty-one girls in one large room, seven of whom were attacked at about the same date. The vessel bringing these rags to New York was not quarantined; the bales were stored with many others which were forwarded to the mills of another county. Of the forty cases in Watertown thirteen or fourteen died."—[*Boston Medical and Surgical Journal.*] This case aptly illustrates the danger of commercial rags from all sources, and the wisdom of Health Officer Smith's recent action in requiring rags arriving at this port to be disinfected before permitting them to be landed, no matter where the place of their destination. And that the public may have a due appreciation of the importance of this action, attention is invited to the commercial practice of England, which shows that some nations, as well as paper-stock merchants, do not scruple at spreading epidemic diseases rather than in the least curtail their business advantages for the protection of the public health. Many persons, doubtless, still remember with what horror the alleged act of sending infected clothing into the Federal lines during the war was looked upon; yet England, according to official authority, is continually permitting the propagation of deadly epidemic diseases through her ports to other nations rather than restrict her commerce. In the United States Consular Reports for 1884 occur the following:

TO CONSUL-GENERAL MERRITT:

BEDFORD SQUARE, LONDON, August 19, 1884.

SIR—I deem it right to point out to you that in my opinion the importation of large quantities of rags into the United States from this country is at present fraught with considerable risk. Small-pox is, and has been for some time, prevalent in London, where quantities of rags are collected and shipped to America, and large quantities of Continental rags are forwarded to London for shipment to American ports. From my inspection of these bales of rags, I cannot, of course, ascertain whether they contain the germs of infection or not, and the

certificates of the shippers are not always to be depended upon as evidence of their source. For instance, a certificate referring to twenty-three bales of rags which were shipped on board the steamship Assyrian Monarch, which sailed for New York from London on the 17th inst., was sent to the Consulate on the 16th inst., stating that these rags had not been collected in any infected district, but not naming the locality where they had been collected. On inquiry, I found that they had come from Dunkirk, in France, where, according to to-day's papers, a case of Asiatic cholera has just occurred. I have also heard that large quantities of Continental rags are now being forwarded to America via Hull rather than via London, there being no United States health inspector at the former port. The sources whence rags are collected are so difficult to trace, and during epidemics of infectious disease rags are so likely to come from infected localities, it appears to me that unless a reliable certificate from a competent authority be produced, stating that they have been properly disinfected, it would be a wise precaution to prohibit the importation.

J. HIGHAM HILL,
Health Inspector.

Consul Louis A. Lathrop reports:

BRISTOL, August 19, 1884.

I have the honor to enclose two copies of a circular lately issued by the British sanitary authorities. It is in reference to the disinfection of rags from France, and refers to an order of the local government board providing that rags landed from France must first be disinfected and inspected by the authorities, unless, the order further provides, the rags are intended for immediate exportation, when no action need be taken. Under this provision it would be entirely competent for a vessel direct from Marseilles, for instance, to tranship its cargo of rags at an English port for the United States. This cargo would then appear as a shipment from England, and would probably be regarded with little or no suspicion. The further provisions of the order, as seen in the circular, are to the effect that if a violation of the order occurs the rags must either be seized or exported. It is evident that, while such an order as this remains in force, a shipment of rags purporting to come from England is as much to be guarded against as one coming direct from France.

Moreover, the local government board (of London), under date of June 23, 1885, orders:

Art. II. From and after the date of this order, and until the first day of November, 1885, no rags from Spain shall be

delivered overside, *except for the purpose of export*, nor landed in any port or place in England or Wales.

Art. III. If any rags are delivered overside, or landed in contravention of this order, they shall, *unless forthwith exported*, be destroyed by the person having control over the same, with such precautions as may be directed by the medical officer of health of the sanitary authority within whose jurisdiction or district the same may be found.

In view of such knowledge, it is surely high time that every one interested in the promotion of the public health should not only sustain but urge upon Health Officer Smith, of the port of New York, and, indeed, upon the health officers of every port in the United States, the importance of allowing no rags, or any ships in which they are brought to this country, to land until they have been thoroughly disinfected. Truly yours,

A. N. BELL.

NEW YORK, August 28, 1885.
From the *Tribune*, September 12, 1885.

THE UNITED STATES MARINE HOSPITAL QUARANTINE AT THE DELAWARE BREAKWATER.

QUARANTINE, S. I., September 4, 1885.

DEAR DOCTOR: Will you do me the kindness to correct the impression which your editorial in THE SANITARIAN for August, on the "Danger of Cholera from Infected Rags," is likely to create; to wit, that the John Gibson was quarantined at this quarantine "nine days"?

It was at the Delaware Breakwater where the surgeon of the United States Marine Hospital quarantined the vessel from August 3d to the 12th, and gave a bill of health clean, with written addition—"This bark, John Gibson, has been cleaned and fumigated." (Signed) WM. P. ORR.

And I will be much obliged. Very truly,

WM. M. SMITH,
Health Officer.

A. N. BELL, M.D., Editor SANITARIAN.

If the case of the bark John Gibson is a fair example of the administration of quarantine at the Delaware Breakwater, it is evident that no protection is afforded by it to the cities on the Delaware or anywhere else; and that the sooner it is abolished the better. A vessel that has been "cleaned and fumigated," and communicates yellow fever within a week thereafter, alongside of the wharf of a populous city, in midsummer,

is a dangerous specimen of "sanitary" service. It has at least demonstrated to the Health Officer of New York that such cleansing and fumigation should not again pass his scrutiny.

THE INTERNATIONAL MEDICAL CONGRESS.

IT seems to us that no impartial reader of the discussion of this subject can fail to see that the real bone of contention, since the American Medical Association asserted its rights and determined to maintain its self-respect, is, and has been from the outset of the work of the first committee, personal ostentation against professional unity. This is said with all due respect to the *personnel* of the original committee as a whole, but with a distinct recognition of the general truth that, as a committee, they had very little to do with filling the programme which has been the cause of the dissatisfaction. With this, it is very well known, very few members of the committee had anything to do; but, having acquiesced in the action which was taken in their name, they have, as a matter of course, felt bound by it, though altogether inconsistent with the modesty which characterizes the true greatness of its members individually.

As the purpose of the Association was to have an International *Medical* Congress, and nothing else, it is reasonable to believe that those members of the profession who have allowed themselves to be misled by the motive which we have endeavored to characterize will, on reflection, appreciate and accept the action of a committee of arrangements for the *honor of the profession*, and not particularly of themselves, as the original intent of the Association.

Moreover, as it is perfectly consistent with the well-merited professional distinction of many of those who have published their unwillingness, under the present auspices, to accept any office for the promotion of the success of the Congress, it is to be presumed they will concede the possibility of finding a sufficient number of others sufficiently distinguished to make the Congress a success notwithstanding.

We are gratified to add, since writing the above, that the organization of the Congress, as proposed by the Committee of Arrangements at its meeting in New York, September 3, is well calculated to, and should, secure the cordial co-operation of the whole profession.

NATIONAL, STATE, AND LOCAL BOARDS OF HEALTH REPORTS.

NATIONAL BOARD OF HEALTH, September 1, 1885.

No. 6.—The following abstract from Consular Reports, etc., received at this office since the date of our last bulletin, is respectfully transmitted for your information:

Montreal, Canada, August 24th.—During the three days, August 20–22 inclusive, 91 cases of small-pox were reported. From August 15th to 21st inclusive, the deaths reported numbered 37; cases reported, August 1–22, 380; deaths, August 1–21, 115.

Week ending August 26th, Toronto, Ont.—One additional case of small-pox reported since the 22d. Every precaution is being taken by the health officer to prevent the spread of the disease.

Note.—On the 29th ult., a telegram from Dr. P. H. Bryce, Secretary Provincial Board of Health, Ontario, stating that at that date there were but two cases of small-pox in the entire province.

Havana, Cuba, August 19th.—Thirty cases yellow fever and three deaths.

Place.	Week ending.	Remarks.
Matanzas.....	Aug. 12th,	1 death from yellow fever.
	Aug. 19th,	No yellow fever reported.
Cardenas.....	Aug. 15th,	Free from cholera and yellow fever.
Santiago de Cuba..	Aug. 8th,	Yellow fever, 6 cases, 3 deaths; typhus, 4 cases, 2 deaths.
Nassau, N. P.....	Aug. 15th,	Free from epidemic diseases.
Acapulco, Mexico...	Aug. 9th,	Free from epidemic diseases.
Antwerp, Belgium..	Aug. 15th,	Small-pox, 8 cases, 2 deaths.
Valencia.....	Aug. 8th,	Small-pox, 11 cases, 4 deaths.
	Aug. 15th,	138 cases and 50 deaths from cholera.
Gibraltar.....	Aug. 9th,	1 fatal case of cholera.
Malaga.....	By cable, August 27th,	cholera officially declared at Almeria; since August 24th, 60 deaths daily. None in Malaga.

Place.	Week ending.	Remarks.
Genoa, Italy.....	Aug. 19th,	1 case small-pox—fatal.
Munich, Bavaria....	Aug. 8th,	1 death from small-pox.
Trieste, Austria.....	Aug. 8th,	2 cases small-pox, 1 death.
St. Petersburg, Rus.	Aug. 1st,	1 death from small-pox.
Warsaw, Russia.....	Aug. 8th,	4 deaths from small-pox.
Calcutta, India.....	July 11th,	22 deaths from cholera.

We give in the following table the number of cases and deaths from cholera in Spain from July 17th, the date of our last report, to July 30th:

Province.	Cases.	Deaths.	Percentage of Mortality.
Albacete.....	791	255	32.2
Alicante.....	2,945	1,403	47.6
Badajoz.....	605	233	38.5
Castellon.....	2,419	959	39.7
Cuenca.....	1,020	498	48.8
Granada.....	857	414	48.3
Jaën.....	790	375	47.6
Murcia.....	2,438	1,046	42.9
Segovia.....	186	79	42.4
Soria.....	538	255	47.4
Tarragona.....	1,341	364	27.1
Teruel.....	2,666	679	25.5
Toledo.....	1,823	699	38.4
Valencia.....	5,676	2,639	46.5
Zamora.....	151	30	19.9
Zaragoza.....	7,464	2,812	39.0
Madrid.....	704	315	44.7
	32,414	13,055	
Previously reported,	48,941	21,846	
Total, March 4 to July 30.....	81,355	34,901	

W. P. DUNWOODY, Secretary.

MICHIGAN.—Sanitarians have claimed that the observance of sanitary precautions would diminish sickness from many diseases; a lessening of sickness in the summer of 1885 was, accordingly, expected. On studying the combined reports of

sickness in Michigan in July, 1885, compared with the average for July in the seven years, 1879–1885, it was found that sickness from all the more important diseases was in July, 1885, much less than the average. A supplementary bulletin was issued giving a list of the diseases, arranged in order of greatest diminution of prevalence. From this and from other information received at this office, it seems very probable that much of the great decrease in sickness was due to the increased sanitary precautions on account of the expected visitation of cholera.

A study of the statistics now exhibits a similar decrease in sickness from nearly every disease in August, 1885, compared with the average of preceding Augusts, 1879–1885. From fevers and bowel complaints there is shown to be a very marked decrease. This seems to confirm what was claimed in the supplementary bulletin for July. It is proper to state, however, that although in July, 1885, the meteorological conditions were not very favorable, in August, 1885, they were favorable to health.

HENRY B. BAKER, Secretary.

LANSING, MICH., September 4, 1885.

NEW HAMPSHIRE.—Fourth Annual Report of State Board for fiscal year ending April 3, 1885, pp. 317. This report opens with a brief, but urgent, appeal for legislative action to sustain the board in its efforts to prevent cholera and other epidemic diseases; for an efficient State quarantine law, with adequate compensation for health officers; power and means for preventing the adulteration of foods, and a general law which will allow the voluntary formation of town corporations for the supply of pure water. This is followed by the Secretary's report on the prevalence and means of prevention of typhoid fever, diphtheria, and scarlet fever; school-house hygiene, cattle diseases, and water pollution. Minutes of the meetings of the board, reports of the proceedings of the Conference of the State Board of Health and of the American Public Health Association, and special papers: "Milk-Supply of Large Towns and Cities," and "Prevention of Disease," by G. P. Conn, M.D., President of the Board; "Some of the Practical Results of Sanitary Engineering," by W. E.

Augier; "Drainage for Health," by Professor R. C. Kedzie; and "Nostrums," by Professor Thomas W. Chittenden. These are all instructive papers for the people, and worthy of extensive dissemination.

The registration report summarizes for the year 1884:

Births, 6,247—18 per 1,000 of State population; 55.99 per cent. only of the children born during the year were of American parentage.

Marriages, 3,292—believed to be approximately correct.

Divorces, 315—the largest number for any one year, except in 1880, when there were 339.

Deaths, 6,194—17.85 per 1,000 of population; 868, or a little over 14 per cent. of the whole number of deaths, were caused by consumption. The greatest number of deaths from this cause occurred in May; and the largest number with reference to age between twenty and thirty, 232. There were 12 between one and five, and 22 over eighty.

Four hundred and thirty-six died of pneumonia; the largest number in December—67. One hundred were of children under five years; 97 between seventy and eighty.

One hundred and fifty-one were caused by typhoid fever. Compared with previous years: in 1882, 214; 1883, 166. The falling off, the report suggests, is consequent upon sanitary work under the auspices of the board.

The public institutions are briefly reviewed, with remarks upon their sanitary improvements and necessities.

Letters of numerous correspondents, in co-operation with the board, show a gratifying progress of sanitary work, with increasing public interest.

NEW YORK: "Introductory, Fifth Annual Report of the State Board of Health," thus explains the deficiency to meet the expenses in 1884, and the embarrassment of the board caused by the Governor's veto of the measure asking for an additional appropriation to meet the deficiency:

"As will be seen by reference to the report of the executive and finance committee, the expenses of the board during the past fiscal year *have exceeded the amount of its appropriation*, the sum voted by the Legislature for the prosecution of its work being but $20,000, while the actual expenditures foot up to $21,971.36.

"Fortunately, an unexpended balance to its credit at the beginning of its last fiscal year enabled the board to discharge its obligations without incurring indebtedness; but the large growth of its registration work, and the unprecedented demand for its engineering and sanitary counsel, *warn the board of threatened financial embarrassment* during the coming year unless the $20,000 granted by the last Legislature for the continuance of its work is *supplemented by a suitable subsidy in the supply bill.*

"Urgent appeals are frequently received from local boards of health and citizens of various parts of the State for advice and assistance in questions of supreme moment to public health, requiring for their elucidation skilled sanitary inspection and often exact analytical examination. As far as the pecuniary resources of the State Board have permitted, prompt response has been made to such appeals; but as they increase in number *lack of means compels reluctant neglect of some of them.* Furthermore, under the duties imposed upon the board, to 'make inquiries in respect to the causes of disease, and especially of epidemics, and investigate the sources of mortality, and the effects of localities, employments, and other conditions upon the public health,' it is evident that a system of sanitary investigation was contemplated far beyond the present possibility of attainment, but absolutely needful to enable it to take 'cognizance of the interests of health and life among the people of the State.' Toward the fulfilment of these, the most important duties of the board, *the sum of* $15,000 *is asked, and even with this,* in view of a threatened epidemic visitation, the demands upon the board during the coming year *will probably exceed its powers of compliance.*

"The regular appropriation of $20,000 barely suffices to defray the expenses incident to the reception, recording, filing, and indexing of the State vital statistics at the central office, together with the voluminous correspondence necessitated by the wide range of questions constantly referred for reply.

"Under direction of the Governor, and in response to appeals from citizens suffering from their injurious effects, inspectors have been employed *to the extent of the board's limited means;* but *here again it has been crippled for want of resources.* Offensive businesses have continued particularly during fogs and under cover of night. Nothing short of a corps of inspectors on duty both night and day can bring about that degree of vigilance necessary for the successful detection and correction of these pernicious practices."

TENNESSEE.—At the quarterly meeting of the board, in July, Dr. J. B. Thornton, President of the Board of Health of

Memphis, who had been a delegate to New Orleans to witness the institution of the new methods of quarantine and maritime sanitation at that port by Dr. Joseph Holt, submitted a favorable report, expressing entire confidence in them. Dr. Charles Mitchell, Health Officer of Nashville, reported an amendment to the city charter, bestowing power to close all springs and wells condemned by the Board of Health, from which he expected important beneficial results to the public health. Dr. W. C. Cook, Health Officer of Davidson County, reported favorable progress in health service under the acts of 1883 and 1885, which he had been instrumental in securing for the prevention of epidemics; for the removal of night-soil, garbage, etc.; and for the abatement of nuisances, under the penalty of misdemeanor and fine. The results have been salutary, and inspired public confidence in the service. Professor J. C. Wharton, of Nashville, reported an efficient method of generating and diffusing the vapors of chlorine, bromine, and iodine, together with sulphurous acid gas, so arranged that one, two, or more of the vapors may be evolved in their most active state by simply burning in an ordinary lamp; the solution being mixed with the ordinary fluid for lighting purposes. Samples of the solutions and lamps were submitted for inspection. Professor W. adds a note to the report, two weeks later, stating that since making it he had ascertained that he had been anticipated in his process by Messrs. Parke, Davis & Co., of Detroit, in the same field; but, as they had not published their process, he was unable to say how far his method was identical with theirs; he thinks, however, his method embraces all that they have accomplished.

AUGUSTA, GA.—Ninth Annual Report of the Board of Health, 1884, reports the favorable action of the City Council for improving and extending the sewerage of the city, and considerable progress in the work; but two-thirds of the squares of the city are still unprovided with sewers, and a filthy soil is the necessary consequence of the filth out-throw from restaurants, kitchens, green groceries, laundries, etc.

Deaths recorded for the year, 842; 311, or nearly 37 per cent., were caused by zymotic diseases—126 by scarlet fever; a proportion in harmony with filthy conditions. Ratio per 1,000 of population (26,000), 32.4.

CHICAGO.—Report of the Department of Health for 1883 and 1884: This report contains but little except tabulated statistics, but that little is comprehensive and cogent. "The stock-yard district has become the rendering neighborhood for a large portion of the civilized world. . . . In 1884, there were slaughtered at these yards 1,025,813 beeves; 3,959,352 hogs; 511,278 sheep; and the blood, bones, feet, scrap and offal of these animals were rendered into grease, glue and fertilizers in so prompt and efficient a manner as to create no offence, unless caused by unavoidable accident to machinery or lack of water-supply. On July 28th and 29th, two shipments of stock—comprising 964 head—reached the yards afflicted with the southern cattle fever; 725 were immediately shot and delivered to the rendering tanks. The remaining animals, apparently in good health, were slaughtered, and about forty per cent. of them disclosed evidence of disease, and the carcasses were condemned." It would be well if the energetic commissioner of health, who has done so much with so few words, had the same authority over the river nuisance; if so, there would be no need of such a quotation as this—repeated from his last previous report: "There can be no question that this slough of filth, coursing through the southwestern portion of our city, is a terrible menace to the health of our citizens. It not only directly creates diseases, but by the septic influence it generates invites the location and development of such germs of epidemic disease as may be introduced from without."

Subordinate reports show that in the distribution of the population, estimated at 600,000, 200,000 men, women and children are employed in factories, workshops, stores, warehouses, elevators, yards, and domestic workrooms; 900 in boarding-houses, and 3,800 in saloons. There are 3,744 tenement-houses, occupied by 42,331 persons. In a special inspection of the tenement-houses during the year, it was found necessary to serve 921 written notices to make *permanent* sanitary improvements. One thousand five hundred and fifty-eight "special" examinations of residences and dwellings, upon the written requests of physicians, required 726 improvements, which were immediately made.

Deaths reported for the year 1884, 12,471—6,666, or 53.45 per cent., were of children under five years of age. Death-rate,

on a basis of 630,000 population, 19.80 per 1,000; of the preceding year (600,000), 19.26; average for the last five years, 21.96, against 18.51 for the preceding quinquennial period; 4,216, or 33.81 per cent. of the total mortality for 1884, were caused by zymotic disease; for 1883, 31.73 per cent. This was a large proportion, considering that "the city has been free from epidemic diseases of every nature" in the face of the registration, which shows that the deaths from *diphtheria* were 649—nearly two a day; *diarrhœal* diseases, 600; *typhoid* (*typho-malarial*), and *typhus fevers*, 426; *measles*, 319; *scarlet fever*, 316; *whooping cough*, 112; *cerebro-spinal fever*, 89: if this is freedom from epidemic diseases of every kind, we are at a loss to understand what would be an indication of their presence. Closely allied to this continued prevalence of epidemic diseases, there were 1,323 deaths caused by acute lung diseases; 1,034, or 8.29 per cent. of the total mortality, a relatively small proportion, was caused by phthisis pulmonalis.

VITAL STATISTICS OF IMMIGRATION.

NAMES OF STEAMERS, DATE OF ARRIVAL, PORT OF DEPARTURE, NUMBER OF PASSENGERS, NUMBER OF DEATHS AND BIRTHS DURING THE VOYAGE FROM EUROPEAN PORTS TO NEW YORK, FOR THE MONTH OF AUGUST, 1885.

Arrival.	Vessels.	From.	Passengers.	Deaths.	Births.
Aug.	3, Servia,	Liverpool,	711	1	
"	5, Wisconsin,	"	219		1
"	6, Waesland,	Antwerp,	338	1	
"	8, Germanic,	Liverpool,	582	1	
"	7, Rhein,	Bremen,	835	1	1
"	17, Aurania,	Liverpool,	763	1	
"	17, Ethiopia,	Glasgow,	224		1
"	18, Moravia,	Hamburg,	630		2
"	19, State of Nevada,	Glasgow,	298		1
"	22, Martha,	Stettin,	332	1	
"	26, Rhynland,	Antwerp,	628	1	
"	26, State of Penna.,	Glasgow,	323	1	
"	28, Salier,	Bremen,	790		1
"	29, Leerdam,	Rotterdam,	145	1	
"	31, Poland,	Hamburg,	177	1	
"	31, Lessing,	"	553		1
			7,548	10	8

MORTALITY STATISTICS IN THE UNITED STATES.

MONTH OF JULY, 1885. Correspondents under this head will please send reports promptly.	Total Deaths.	Deaths under 5 years.	Lung Diseases.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
Burlington, Vt., 13,300	...	...	...	..	..	..	..	..	..	..	....
*Lowell, Mass., 66,500	122	64	8	1	1	..	..	2	..	..	24.0
†Worcester, Mass., 58,295	57	42	5	1	..	..	..	..	..	25	15.3
Providence, R. I., 120,000	240	99	37	5	2	2	1	3	..	59	24.0
New Haven, Ct., 78,000	197	121	19	2	2	27	3	5	..	57	30.3
New York, N. Y., 1,397,395	4,312	2,516	644	151	35	52	49	71	2	1,472	37.0
Brooklyn, N. Y., 665,602	2,052	1,338	268	37	25	12	9	32	..	898	37.0
*Buffalo, N. Y., 205,000	280	154	35	15	2	9	2	9	..	50	17.8
Long Island City, N. Y., 21,000	64	36	7	2	..	..	..	..	1	25	36.5
Albany, N. Y., 95,000	194	91	22	10	3	9	..	4	..	29	24.1
Yonkers, N. Y., 22,000	71	46	5	..	..	..	..	1	..	36	38.6
Cohoes, N. Y., 20,000	45	28	4	..	..	..	..	1	..	15	27.0
Troy, N. Y., 60,000	127	50	34	..	1	1	..	8	..	31	25.4
Syracuse, N. Y., 65,000	71	29	15	..	..	..	..	4	..	11	13.1
Utica, N. Y., 39,000	62	15	8	7	..	..	..	..	..	7	19.0
Auburn, N. Y., 26,000	28	6	2	..	..	..	..	1	..	6	12.9
West Troy, N. Y., 13,000	31	15	4	1	1	..	..	..	..	11	28.6
Rochester, N. Y., 101,000	166	76	25	12	..	..	..	1	..	34	19.7
Kingston, N. Y., 20,000	51	29	9	2	..	3	1	2	..	17	30.6
Newburgh, N. Y., 20,000	38	21	6	..	..	1	..	1	..	10	23.8
Poughkeepsie, N. Y., 20,207	41	16	5	1	..	..	..	4	..	6	24.3
Oswego, N. Y., 24,000	23	6	5	..	..	..	..	1	..	..	11.4
Fredonia, N. Y., 28,000	5	2	...	..	..	1	..	..	..	1	21.4
Binghamton, N. Y., 20,000	37	16	24	1	..	1	..	1	..	14	22.2
Elmira, N. Y., 25,000	25	11	8	1	..	1	..	1	..	4	12.0
Hudson Co., N. J., 213,000	...	...	...	..	..	..	..	..	..	..	....
Paterson, N. J., 57,000	149	100	9	1	..	..	..	4	..	50	32.7
†Philadelphia, Pa., 949,432	1,634	860	226	35	16	15	11	33	..	372	29.6
*Pittsburgh, Pa., 180,000	415	233	56	12	17	2	5	16	..	..	27.0
Erie, Pa., 36,000	43	19	15	..	..	..	4	2	..	2	14.3
Wilmington, Del., 53,500	138	80	8	..	1	..	..	3	..	38	30.6
*Cincinnati, O., 325,000	603	338	76	5	6	1	..	6	..	189	24.3
Toledo, O., 52,000	91	45	8	2	..	..	..	..	..	24	15.6
Detroit, Mich., 165,000	398	130	42	7	9	1	7	7	..	112	28.4
*Rock Island, Ill., 11,650	18	5	2	..	..	..	..	..	..	2	18.7
Chicago, Ill., 630,000	1,493	924	161	44	12	16	14	118	..	456	28.4
St. Louis, Mo., 400,000	856	440	115	10	14	3	3	42	..	184	25.6
Milwaukee, Wis., 160,000	249	75	36	4	..	3	..	9	..	43	18.6
San Francisco, Cal., 235,000	458	...	100	42	..	5	1	12	..	17	24.8
Minneapolis, Minn., 129,200	167	122	19	5	..	..	..	9	..	75	15.5
St. Paul, Minn., 110,000	199	129	15	9	2	1	..	4	..	66	20.5
*Baltimore, Md., 408,520	988	585	112	12	5	5	8	22	..	281	29.8
*Dist. of Columbia, 200,000	460	242	63	..	8	3	8	17	..	115	34.2
Richmond, Va., 75,000	237	117	31	2	..	..	1	10	..	45	37.9
†Lynchburg, Va., 23,000	42	11	6	..	..	..	..	4	..	12	25.2
New Orleans, La., 234,000	560	246	98	5	4	3	10	48	..	65	28.7
Nashville, Tenn., 50,000	133	47	17	2	..	1	..	8	..	26	26.4
Mobile, Ala., 31,295	148	38	10	1	..	1	..	15	..	8	37.5

* 4 weeks; † 3 weeks.

MORTALITY STATISTICS ABROAD.

FOUR WEEKS ENDING JULY 25, 1885.	Total Deaths.	Deaths under 1 year.	Bronchitis and Pneumonia.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Typhoid and Typhus Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.]
London, 4,083,928.....	6,080	1,070	600	116	45	300	238	48	53	606	19.2
Liverpool, 579,724.....	952	261	...	91	16	70	42	18	2	28	21.4
Glasgow, 517,941.....	879	216	142	7	14	18	51	9	..	41	21.4
Birmingham, 427,769...	500	135	...	1	1	12	12	3	..	10	15.2
*Dublin, 353,082.....	436	72	51	5	15	10	8	8	..	18	16.6
Manchester, 337,342....	638	171	...	..	3	49	24	5	..	21	22.1
Leeds, 333,139.....	447	133	...	1	19	2	20	3	..	16	17.4
Sheffield, 305,716.....	462	124	...	..	7	16	19	2	..	18	18.9
Edinburgh, 246,703....	286	61	45	3	..	4	7	2	..	12	14.8
*Belfast, 219,222.....	338	54	77	..	4	61	16	3	..	9	30.1
Bradford, 214,481.....	235	45	...	..	1	..	12	1	..	6	14.3
Hull, 168,292.....	211	44	...	..	1	..	2	3	..	4	17.2
Newcastle, 153,209.....	296	77	...	..	8	29	6	6	..	8	25.6
†Havre, 105,867.....	114	30	15	3	1	1	..	5	..	15	27.9
Rheims, 93,823.....	232	111	25	4	..	..	..	15	..	82	32.1
†Nancy, 76,358.....	83	23	1	..	..	11	3	7	..	6	28.2
*Breslau, 295,000.....	767	410	30	4	4	..	5	3	..	265	44.8
Brussels, 175,811.....	286	83	27	10	1	..	4	2	..	57	21.0
Cologne, 153,500.....	422	205	26	3	1	14	4	2	..	106	34.9
Christiana, 126,000.....	210	65	14	34	11	..	3	..	..	91	21.3
FOUR WEEKS ENDING JULY 18, 1885.											
Frankfort, 147,900.....	251	76	10	5	2	..	..	1	..	34	21.0
Hanover, 135,400.....	236	101	17	1	1	15	..	..	..	36	28.9
Bremen, 121,550.....	182	47	31	1	3	..	..	..	..	7	20.5
Dantzic, 119,240.....	254	150	17	6	3	..	..	1	..	55	28.0
Stuttgart, 110,918.....	199	84	15	9	1	..	..	2	..	26	23.6
Strasbourg, 110,789....	201	84	13	2	1	..	..	1	..	39	25.3
Dusseldorf, 110,033....	189	77	21	4	..	..	..	1	..	31	23.0
Nuremburg, 107,132....	198	105	14	10	..	..	..	1	..	74	26.4
Chemnitz, 106,163.....	300	185	8	4	1	..	..	..	..	9	35.0
Magdeburg, 109,000....	246	137	23	10	1	8	..	2	..	39	31.7
Elberfeld, 103,200.....	149	53	21	2	1	..	..	..	..	7	19.1
Barmen, 102,000.....	167	52	13	4	4	..	..	4	..	7	26.4
Altona, 98,550.....	175	64	18	9	2	..	..	2	..	16	22.9
Aix-la-Chapelle, 90,300.	217	91	22	..	..	..	..	..	..	8	29.2
Mayence, 65,000.....	130	64	14	..	1	..	..	..	..	27	25.2
Amsterdam, 361,314....	601	...	...	8	11	11	4	3	..	....	21.2
Rotterdam, 166,001....	254	...	...	2	2	..	3	1	..	6	21.9
The Hague, 134,552....	194	...	...	1	..	..	9	..	..	3	18.7
Lyons, 376,613.....	661	84	64	3	4	..	5	4	1	82	22.8
Berlin, 1,263,455.....	3,708	2,262	202	118	26	47	..	12	..	1,288	36.5
Hamburg, 497,956.....	706	247	57	43	8	3	7	5	..	94	24.6
Dresden, 241,500.....	472	200	34	11	3	3	..	3	..	57	26.2
Munich, 244,000.....	580	265	38	9	7	6	..	2	1	135	30.8
Leipsig, 168,976.....	290	141	19	15	1	8	..	3	..	27	23.0
Königsburg, 157,660 ...	482	6	31	22	1	1	..	6	..	149	39.0
Bucharest, 200,000....	392	131	39	..	15	3	1	8	..	66	25.4
*Paris, 2,239,928.....	2,687	482	214	62	8	72	20	86	6	259	20.8
‡Calcutta, 433,219	788	...	...	..	..	5	..	228	..	788§	22.1

* 3 weeks; † 2 weeks; ‡ 4 weeks ending June 20, 1885; § Cholera.

LITERARY NOTICES.

THE INHALATION TREATMENT OF DISEASES OF THE ORGANS OF RESPIRATION, INCLUDING CONSUMPTION. By Arthur Hill Hassall, M.D., Lond., Member of the Royal College of Physicians of England; late Senior Physician to the Royal Free Hospital; Founder of, and Consulting Physician to, the Royal National Hospital for Consumption and Diseases of the Chest; Physician to the North British and Mercantile Ins. Co.; Author of "The Microscopic Anatomy of the Human Body in Health and Disease;" "The Urine in Health and Disease;" "San Remo Climatically and Medically Considered;" and various other works. With numerous Illustrations. 12mo, pp. 367. London: Longmans, Green & Co.

This work fills a gap which has long existed in the scientific treatment of a subject which has hitherto consisted of a great deal of heterogeneous material; some good, but more of bad, or at least crude, and proportionally difficult of application, or worse than useless. The comprehensive scope of the author's observations, based upon a thorough knowledge of the conditions under which remedies may be advantageously applied by inhalation, has been such as to commend his work at the outset; and the strictly scientific method of his investigations with regard to the obstacles to be overcome, the kind of remedies adapted to the treatment of disease by inhalation, the best means of applying them, and the indications for their use, doubtless will, as they should, command the respect and thoughtful consideration of all medical practitioners who would not deny themselves any means for the good of their patients —above all, with reference to diseases of the respiratory organs. The work is a substantial contribution to practical medicine.

TEACHERS' INSTITUTES, Circular of Information, No. 2, 1885, of the Bureau of Education, contains a great deal of information of interest to school-teachers and officers and boards of education.

ASSOCIATION OF THE ALUMNI OF THE ALBANY MEDICAL COLLEGE—Proceedings of the Twelfth Annual Meeting, March 4, 1885, a pamphlet of sixty-eight pages—contains an admirable lecture on "*The Germ Theory of Disease*," by Prof. William H. Thompson, M.D., summarizing the gist of the subject in relation with preventive measures. The Alumni Lecture for 1886, the Executive Committee announce, will be by Dr. S. Oakley Vander Poel, on "*Hygiene: Its Relations to the Profession and the General Public.*"

POISONS, THEIR EFFECTS AND DETECTION: A MANUAL FOR THE USE OF ANALYTICAL CHEMISTS AND EXPERTS, WITH INTRODUCTORY ESSAY ON THE GROWTH OF MODERN TOXICOLOGY. By ALEXANDER WYNTER BLYTH, M.R.C.S., F.R.S., etc., Public Analyst for the County of Devon, and Medical Officer of Health and Public Analyst for St. Marylebone. With Tables and Illustrations. Vol. II., pp. 333. New York: William Wood & Co.

RENAL AND URINARY AFFECTIONS. By W. HOWSHIP DICKINSON, M.D., Cantab., F.R.C.P., Physician to, and Lecturer on Medicine at, St. George's Hospital; Consulting Physician to the Hospital for Sick Children; Corresponding Member of the Academy of Medicine, New York. Pp. 353. New York: William Wood & Co.

These are the July and August volumes of "Wood's Library of Standard Medical Authors." Vol. I., of Blyth on Poisons was noticed in our last number. The volume now before us completes the work. As before remarked, it is sufficiently well known as standard authority, to require announcement only as one of the books of this series, at a price which ought to place it in the library of every medical practitioner.

The work on Renal and Urinary Affections is, in some degree, a companion volume to "Albuminuria," by the same author, in the third series of the "Library," 1881. While "numerous cases cited in detail in the English edition of this volume have been omitted," the publishers inform us, "it is nevertheless, especially if taken in connection with the volume on 'Albuminuria,' one of the most comprehensive works on the subject of which it treats in the English language. It

deals fully with the circumstances of phosphatic excess, and of the addition of sugar, albumen, chyle, and blood, and other prominent morbid states; and more concisely, but nevertheless clearly, with the other conditions in most practical works, fortified by extensive clinical experience."

PUBLICATIONS RECEIVED.

Duty of the State toward the Medical Profession. By Conrad George, M.D. Reprint from the *Physician and Surgeon.*

Cholera Infantum. By William Perry Watson, A.M., M.D. Reprint from *Archives of Pediatrics.*

Surgical Notes from the Casebook of a General Practitioner. By William C. Wile, M.D. Reprint from *New England Medical Monthly.*

Laws of Maternity. By Nathan Allen, M.D., LL.D. Reprint from *New England Medical Monthly.*

Homœopathy and its Relation to the Germ Theory. By Robert N. Tooker, M.D. Reprint from the *Medical Era.*

Proceedings of the Sanitary Conventions held at Hillsdale, East Saginaw, and Lansing, Michigan, 1884 and 1885.

Failure of Legislation in Limiting the Spread of Venereal Diseases. By E. W. Allison, M.D., and W. E. Ashton, M.D. Reprint from Philadelphia County Medical Society Proceedings, p. 12.

PAPINE.—Dr. William H. Olsten, of Ephraim City, San Pete County, U. T., says: "I wish to state in a few words that papine has been thoroughly tested by me, and I cheerfully give the following results, viz.: I have used it in several cases of facial neuralgia with efficiency. It gave a better satisfaction than opium or morphine as well as chloral hydrate. In a case of hepatic calculus it acted like a charm, although it had to be given in rather large doses, and the influence had to be kept up. The results make it necessary for me to keep it in my office dispensary in future."

THE SANITARIAN.

OCTOBER, 1885.

NUMBER 191.

HOW CHOLERA AND SMALL-POX ARE SPREAD, AND THE FALLACY OF THE MEANS ORDINARILY USED FOR THEIR PREVENTION.

By A. N. Bell, A.M., M.D.

It is not the purpose of this summary to show how much evidence can be adduced to prove that cholera and small-pox are chiefly spread by *fomites;* and that in order to prevent their spread by such means the most powerful and the *only* reliable disinfectant is *heat.* To present such evidence in detail would at least fill all the pages of a single issue of The Sanitarian.

The word *fomites* is here used instead of "rags," because of its greater comprehensiveness, and, moreover, as will presently appear, because other things, wearing apparel especially, only differ from rags in their liability to spread infection according to circumstances and quantity.

From St. Louis, Mo., to Germany.—After the reading of Dr. Koch's paper on "Cholera, and its Bacillus," before the Imperial Board of Health, in Berlin, 1884, a discussion on the subject took place, on July 29th, in which Professor Leyden referred to the reported case of a trunk from America having spread infection:

"Professor Hirsch said that when travelling through the

districts of Western Prussia and Posen that were visited by cholera in 1873, having been sent there specially by the Imperial Chancery, the task set before him was to collect facts which could prove whether, and how far, cholera can be introduced by personal effects, and how long defiled linen remained infectious. He investigated cases where objects of this kind had been brought from infected localities to distant neighborhoods previously free from cholera. In several of these cases the personal effects had remained unused for some time, and had then been unpacked and cleaned, if soiled. Now, the first cases of cholera were always in those individuals who had had to do with infected things; then other members of the same family or the same household; and then the disease not seldom spread over the locality from this centre. Concerning the case quoted by Professor Leyden, Professor Hirsch said that in the town of Mülhausen, in Thuringia, there were nine cases of cholera, four of them proving fatal, in the cholera epidemic of 1873, all of which, with the exception of one case, belonged to one house. The house was inhabited by six families, numbering twenty-three persons; three of the families, numbering eleven, inhabited the basement floor. Behind the house was a drain of a closet, which was used only by the inhabitants of the basement, other water-closets existing for the inhabitants of the higher stories. The first case, which took place on August 26th, was that of a woman who had come a few weeks before to Mülhausen from St. Louis, in the United States of America, *via* New York, Hamburg, and Bremen, but had only received the things which she had left behind from America about the beginning of August. Among these effects were some soiled linen, which she sent to be washed, and some confectionery, which she and her sister, in whose family she was living, partook of. A few days afterward the new-comer was attacked with cholera; then the sister; her child and her grandmother also had severe attacks of diarrhœa, and soon afterward cases of cholera occurred among the other families inhabiting the basement, so that out of the eleven persons inhabiting the basement only two escaped the disease, and four died of it; while from among the inhabitants of the upper stories, who had afforded the sick persons assistance, who also took charge of the old woman and child who had become ill,

not one case of cholera occurred. That at the time when the effects left St. Louis cholera had been raging with especial severity, in the quarter of the town, too, from which they came, has been accurately proved. The appearance of the cholera in that house at Mülhausen, where there had been no case till then, after the arrival of the luggage, induces the reporter of the case to believe that the specific poison of the disease was introduced with the baggage, and that the further spread of the disease among those inhabitants of the basement who had not come into contact with the things was explained as infection from the closet used in common by the inhabitants of the basement, the dejecta of the first patient having been thrown into it." *

From Stores in an Old Hulk to Toulon, after Thirty Years' Retention.—Before the Public Health Section of the British Medical Association, July 29, 1885, a paper on "Cholera, and the City of Cardiff" was read, by Dr. Paine, of Cardiff. In the absence of the author, it was read by Dr. Vacher, of Birkenhead. He gave in his adhesion to the germ theory of the disease:

"It is a specific organism which causes cholera, which may continue latent for a long period, as exemplified in the origin of the cholera in Toulon last year from stores in an old hulk that had lain by since the Crimean War, in 1854. In 1849 cholera first visited Cardiff, in May, when it first occurred in Caroline Street, and in a few days spread through the contiguous streets, where the water-supply was polluted. There were 351 deaths in a population of 16,693. A temporary hospital was erected for cholera patients. After this epidemic a complete system of drainage was established. In 1853 a man came to Cardiff with cholera from Bristol, and was removed to a building near the work-house. The man in charge took the disease and died in a few days, and also the nurse; but there were no more deaths. In July a foreign seaman with cholera was found in a seaman's lodging-house in Millicent Street; he died of it, and his infection was traced to a foreign vessel. Two days after this cholera broke out in the street, and deaths took place in the houses adjacent to No. 49, where

* British Medical Journal, September 27, 1884, p. 628.

he died. Thirteen cases arose in two days. Convalescents were removed to the temporary hospital, where each patient remained a few days and was then discharged. No second case occurred in the family thus treated. The use of well-water was prohibited, and pure water was used. In 1866 cholera entered Cardiff from the sea, but only 44 died of it. A block of nine houses in Morgan Street was found where one case of cholera occurred. All of these houses were supplied from a pump; eight of the houses used this supply. Ten cases occurred in the houses. The ninth house used water from a public supply and escaped. In 1884 fear was entertained lest the disease should come to Cardiff from Toulon. A steamer was therefore employed to board all vessels arriving from suspected ports, to put the cholera questions. If any case of cholera was reported on board, the patient was removed to a temporary hospital on the island of Flatholm, and the crew carefully inspected. All infected vessels were thoroughly disinfected before being admitted into port, the bilge-water being carefully discharged. Four vessels with infection on board arrived, from which three cases of cholera were removed and treated in hospital. By such care cholera is robbed of its chief terrors.

"DR. BALLARD, of London, said the most agreeable feature in the paper read was that no mention was made of the bacillus. Dr. Pringle had followed the line of argument pursued before there was any talk of germs, and he thought the younger members of the profession would do well to look mainly after local conditions for the prevention of cholera.

"MR. DYKE, Medical Officer of Health at Merthyr, said he had had experience of four outbreaks of cholera in Merthyr, and was ready to express his opinion that the spread of cholera was greatly caused by filth. If filth were removed, cases of cholera would not occur.

"DR. J. MARTIN, of Weston-super-Mare, gave a description of cholera in two contiguous villages—one healthy and situated on a gravel soil, and the other dependent on a polluted water-supply. The latter was severely attacked.

"DR. DAVIES praised the immense care of Dr. Paine. There was at present no power to deal with persons on board ships unless they were actually ill. He thought power ought to be

given to detain the rest in an infected ship for forty-eight hours, until danger of contagion was over.

"DR. C. R. DRYSDALE, of London, considered that cholera was as specific a poison as small-pox or syphilis, and that this poison entered the system either through the lungs or by means of a contaminated water-supply. Some persons said it was not taken from the sick, but in the Punjaub, in one epidemic, seven hundred attendants on the sick had taken it. The Broad Street pump in London was contaminated in 1856, and in ten days five hundred persons were attacked with cholera. Of nineteen persons who drank water contaminated by fresh excretions, in one epidemic, five died within forty-eight hours. The disease never appeared in any city unless some person with cholera entered that city. It was impossible in European cities for cholera to arise *de novo*. If all these undeniable facts were granted, the conclusion was inevitable, that cholera was a contagious zymotic disease, and could only be prevented in the way that typhoid fever, syphilis, or other poison diseases were prevented; *i.e.*, by the segregation of the sick, the disinfection of the discharges from the patient, which should not, if possible, be allowed to enter the sewers, and by the greatest attention being paid to the water-supply. Pure water-supply in Hindostan had greatly lessened the mortality from cholera among our troops. Then, again, the flooding of the Bristol sewers, by Dr. Davies' advice, in 1866, had cut short the epidemics when they arose in any part of that city. Of course, cleanliness and comfort were admirable prophylactics of all similar diseases, but even the most cleanly people would contract cholera, syphilis, or small-pox, if the contagium were in their midst. Hence, the main point in the prophylaxis of cholera was to take care that it was recognized to be a contagious zymotic disease, and, if this were understood, hygienic measures would be clear enough. As to treatment, it was clear that the purging and vomiting were the efforts made by the system to free itself from an asphyxiating poison. Hence, opium and astringents were contraindicated, but no clear treatment was as yet made out for the guidance of the profession.

"DR. CORNER, of Poplar, was much in favor of disinfection of sewers by perchloride of iron, but did not quite agree that opium was contraindicated. The report of Dr. Lewis, in 1866,

with respect to the post-office officials, in regard to those men who had used a prescription for incipient diarrhœa containing a confection with opium, showed that opium seemed to have some power in preventing the onset of the disease. The use of doubtful water should be sedulously avoided.

"DR. BALLARD said he did not mean to assert that there was nothing living in the causation of cholera, but maintained that it was not proved to be a germ-caused disease. He thought it very unfortunate that the public should be led to think the disease was contagious until this was fully proved to be the case.

"SURGEON-GENERAL CORNISH said the subject of cholera had attracted his attention for the past thirty years. He could not help thinking that it was communicable from persons with the disease to others. The spread of the disease could be greatly lessened by attending to the cleanliness of cities, and to the water-supply. It was probably a germ-caused disease. Dr. MacArthur had treated an epidemic in the east of Fifeshire. There were there two very filthy villages, St. Monans and Pittenweem, quite in the neighborhood of each other. In the first of these no cholera had occurred, but in the second there were many cases. The only difference between these villages lay not in the filth, but in the purity of the water-supply, which in the former came from a mountain lake, while the other was contaminated with sewage. The poison of cholera was clearly very soluble in water. With regard to the opium treatment, he had some doubts what was best to do; he remembered that Murchison had proposed morphia and chloric ether.

"DR. DAVIES said he would not mind burying the word germ, if that was likely to lead to dispute. He had seen a great deal of cholera. First of all, he saw it in Bristol, in 1869, when, being a bachelor, he was asked to look after the paupers, who were then dying very fast of the disease. He then learned the tactics of the enemy. In the wards he was attached to none of the boys had been attacked, until one boy climbed over the railing and bit the buttons from the trousers of an old man who had died of the disease. That boy died within twenty-four hours. Dr. Evans, one of the masters of the Bristol school, would insist on drinking water from Jacob's Well, a contaminated source. He died of cholera. Typhoid fever subse-

quently attacked nine houses supplied with water from that well. In 1866 he acted on the supposition that there was something portable in the poison of cholera which might be attacked by chemicals. After talking the matter over with Dr. W. Budd, he had the drains flushed with a solution of perchloride of iron, which had acted marvellously well, and was a very cheap method of avoiding death from this terrible disease. As to treatment, he had tried the fractional doses of calomel, as advised by Dr. Ayres, of giving two grains of calomel every ten minutes, and also the plan of giving drachm doses, but these had been of no service. All the patients to whom castor-oil had been given died, so that his present views of treatment were almost equivalent to *nil.* Sanitary measures are essential. He agreed with Dr. Drysdale in all he said, but, after all, the non-contagion advocates followed the same practical remedies.

"DR. PRINGLE, in reply, said cholera did not exist among the lower animals, except, perhaps, among cows. If cholera were infectious, or contagious, he thought he would have taken it when treating so many in Hindostan. The condition of the poorer classes should be seen to, and their houses emptied. Neither opium nor sulphuric ether were of any service. (Abstract of Report of Proceedings, Public Health Section, British Medical Association, New York *Medical Record*, August 22, 1885).

Clothing, Rags, Wool, etc.—"The evidence of last year's epidemic seems to prove conclusively that the contagion of cholera is transmitted both by the inhalation of air infected by clothing, rags, wool, etc., which have been tainted by contact with the disease, and by water. In proof of the first proposition may be cited the case of a man who, in July last, left one of the most affected quarters of Marseilles for his native village of Vogué, in the department of Ardèche. He remained there in perfect health until he opened his trunk, which had been packed at Marseilles, and wore a suit of clothing that it contained. Immediately thereupon he and several persons with whom he was living were fatally attacked, and within twenty days 54 of 630 inhabitants of the village had perished. To this may be added the conclusive fact, that the epidemic of 1884 was kindled in Marseilles by the clothing brought to this

city in the trunk of a young student coming from the Lycée at Toulon.

"Equally striking, as an example of the power of water to diffuse the contagion, was the case of the village of Omergues, in the department of Basses-Alpes. On July 10th there arrived at Omergues a young servant girl, who had been in service at Marseilles. Soon after her arrival she washed some linen, which had been in contact with a cholera patient at Marseilles, in the Jahon, a creek which supplies the village with water. From that imprudence sprang the contagion which decimated that unfortunate community and spread death throughout the entire valley of the Jahon below Omergues, while the inhabitants of the same valley above the village escaped.

"Concerning the general question of the transmission of cholera, the medical authorities of Marseilles are united in the following conclusions:

"1. The disease does not transmit itself *directly* from a cholera patient to a person in good health, neither by contact nor by inhalation.

"2. The dejections and vomit of a cholera patient usually contain the germ of contagion, which, although not immediately transmissible itself, yet, when placed under favorable conditions, quickly breeds and develops the contagious principle by means of which cholera always operates, whether through the medium of air or water.

"3. Clothing and textile merchandise are far more dangerous as vehicles of this contagious principle than individuals.

"4. This choleraic poison attacks only persons who are in a greater or less degree prepared for its inception, and in proportion to the degree of this receptive condition it produces cholera or cholerine. In other words, cholera is not directly contagious, like scarlatina, small-pox, or diphtheria, but is a disease producing a germ which, in order to become contagious, requires to pass through a certain process of development. As this germ is contained in the dejections and vomited matter of cholera patients, it is of the first importance to immediately neutralize such matter by contact with powerful antiseptics.

"For this purpose the five antiseptics which have been found most effective are:

"1. Solution of sulphate of copper in the proportion of not less than two ounces to a quart of water.

"2. Chloride of zinc, half an ounce to a quart of water.

"3. Bichloride of mercury, one-sixth of an ounce to a quart of water.

"4. Bichloride of copper, two ounces to a quart of water.

"5. Sulphuric acid, four ounces to a quart of water.

"The same chemicals are used for the disinfection of water-closets, sinks, and all other seats of decay or infection.

"Cholera on ship-board was notably fatal and violent, not less than twenty-seven of the thirty-six cases of sailors attacked on vessels in this port having resulted fatally. Nearly all of these cases were of the 'foudroyant,' or rapid, unmanageable type. The holds of ships, tainted with bilge-water and the miscellaneous leakage and refuse of previous cargoes, are fertile hot-beds of choleraic atmosphere, and only the most scrupulous cleanliness and careful ventilation can avert this danger in the presence of an epidemic. For the disinfection of ships, a strong solution of chloride of zinc, liberally used, has been found most effective."—*Supplement Report to Cholera in Europe in* 1884. *Frank H. Mason, Consul, Marseilles, June* 23, 1885.

The "Sulphuring Process" of Rags Abroad.—In a letter to the *Journal of the American Medical Association*, August 22, 1885, the Medical Inspector attached to the Consulate at Berlin, over the signature of H. R. B., gives the following account of the trade in rags and the means used to *avoid* disinfection at American ports:

"The chief baling and shipping stations in North Germany are Königsberg, Dantzig, Stettin, Riesa, Berlin, Hanover, Harburg, and Hamburg. The chief firms controlling this business are Lewy Gebrüder, of Königsberg and Berlin; Lewy & Strich, of Königsberg and Berlin; Gebrüder Salomon, of Hanover and Harburg; and Wertheim, of Hamburg. This latter gentleman is agent for Germany of a patent disinfecting arrangement erected in New York Harbor, which so far meets with little favor. Merchants here will not ship rags to be disinfected in New York, because, among other reasons, of the greater expense, so the company endeavors to force patronage by untruthful statements of foreign inspection, or by sensational reports of the rapid advance of cholera.

The rags shipped from these ports are all North of Germany or Russian rags, quite clean and free from infection. In their disinfection they lose their dust, which is a gain to hygiene, though a loss to the merchants, as it reduces the weight. There has not been a case of cholera in this region of country for over eight years, and there have been but very few instances of malignant dysentery. Every year, from North Germany alone, there are shipped to the United States about one hundred thousand bales of rags.

"The sulphur process is in favor here. In Berlin, Hanover, and Harburg I have made use of the following plan: A large room in the warehouse is set apart as a disinfecting room. In the centre is a well of fire-proof stone, resting on a floor of the same material, about six feet square, the sides being four feet high. In the middle is a large graphite pot for the sulphur, and the whole is covered with an iron grating. The windows and doors are all tightly closed. The rags are scattered about on the floor and racks, and are kept in the fumes for five hours. In the ceiling is a large ventilator, which is opened from the outside by a string and pulley. This is opened at the expiration of the disinfection. In Königsberg I utilized an old sugar-house with a chimney 120 feet high. There was one large room where the rags were scattered about, and a small room adjoining, in which a special furnace of brick was built for the burning of sulphur. Four large tubes perforated the partition between the two rooms, through which the fumes of the sulphur are blown. This is a very practical and safe arrangement. The large chimney was used as a ventilator. About seventy pounds of sulphur are consumed every day by each of the two firms exporting from Königsberg. Working full force, and keeping late hours, each firm in Königsberg, if pressed, could disinfect and press nearly three hundred bales per diem. In this city more rags are baled and shipped than from any other port in Germany—perhaps from any other two cities. The business here is almost entirely controlled by Lewy Gebrüder and Lewy & Strich. Berlin does but a small business, averaging, perhaps, forty bales per diem. If the market were active, the same two firms, who also control the business here, could bale about one hundred and fifty bales each per diem. Since my appointment the Berlin firms have only dis-

infected about two thousand seven hundred bales, burning on the average fifty pounds of sulphur for each twenty or twenty-five bales, and disinfecting sometimes twice in the day. In Hanover and Harburg the Gebrüder Salomon have extensive facilities, and, if necessary, could bale in the two places about three hundred and fifty to five hundred bales per diem. I have inspected about seven hundred bales from each of these cities.

"Now the question naturally arises—How is it possible for one inspector to give his personal attention to places so widely separated from each other? The answer is a simple one. At no one city is the business constant. It is always intermittent. Little is done at Berlin, and that irregularly. At Königsberg it is also spasmodic. While disinfection is going on in Berlin I stop it at Königsberg. By special permission of the Consul-General, and as a favor to the merchants, I went to Hanover and Harburg. The quantities here being small, we finished rapidly by working full force and long hours. I do not suppose that any scientific man claims that the sulphur process has any effect as a germicide upon the bacillus of Koch. Bacilli are killed by drying, but it is necessary to bear in mind that they must be exposed to the drying process in thin layers. At the temperature of boiling water they are invariably killed, but not *their spores.*"

And here the writer makes an absurd quotation from Klein, which purports to show that the *spores* of Koch's bacillus are protected from the influence of heat and other disinfectants by a double sheath, an internal one of a fatty nature, and an external one, probably of cellulose, as if such substances could possibly afford the alleged protection. And this, too, in the face of the doubtful existence of any such spores—none having been demonstrated. But, on this assumption, he goes on to state:

"While it is undoubtedly true, then, that disinfection is valueless as a preventive of cholera, it is equally true that its value as a hygienic measure may not be over-estimated. All rags coming to the United States for the next few years should be disinfected, because this process does act as a germicide in the micro-organisms of typhoid (?)—probably this is not a specific organism, but a migratory one from the degenerated

intestine—small-pox, diarrhœa, dysentery, etc., and just in proportion as the disinfection is thoroughly done, so much the better will the health of our entrepôts be. But why this anxiety about cholera? Even in Spain the disease has assumed but small proportions, and Spain is many miles removed from Berlin. The health of North Germany is perfect, and if it be true that rags may convey the potent cholera bacillus, it seems strange that the many hundreds of men, women, and children who are engaged here in assorting, baling, and arranging, who daily respire for many hours the "rag" atmosphere, and whose bodies are in a ripe condition for infection, never show any symptoms of the disease. It is natural to suppose that the first evidence of rag infection would be manifested in the persons of those here in Germany who are engaged in handling them. Does the bacillus (or the spores thereof) carry a potency for cholera within its microscopic envelope."

The inspector's reflections, on the escape from cholera of many persons engaged in handling rags, are of a piece with Mr. Ramage's observations at Holyoke and other places, to which we have before called attention; and his estimate of the slow progress of cholera in Spain, two months ago, compared with what it has since become, may be appreciated by reference to the proportions of the epidemic, as summarized on other pages by the Secretary of the National Board of Health, at that time and the present.

With regard to the disinfection of ships with a solution of sulphate of zinc, or anything else of that kind, as mentioned by Mr. Mason, the proposition is so utterly absurd, to anyone familiar with the structure of a ship, that it requires no comment.

It is clear that all such means are utterly futile for their intended purpose, that the disease has made steady progress, and has now reached alarming dimensions in and beyond Spain. How much longer ere it reaches the United States is uncertain. But, judging from its prevalence in places abroad in constant commercial intercourse with this country, and the continued neglect to use the only disinfectant which the most distinguished sanitarians in the world have pronounced reliable for the purification of fomites, it surely cannot be long.

Indeed, at the very time of this writing (September 26th) the arrival of a cholera-infected ship at the port of New York is announced:

"The Italian bark Excelsior, which arrived yesterday from Marseilles, reports having had one fatal case of cholera on board.

"The Excelsior sailed from Marseilles July 20th, loaded with a round cargo. When three days out from port a seaman, whose name could not be ascertained, died of malignant cholera, and was buried in the Mediterranean. His clothing was burned, and everything belonging to him destroyed. The men, ten in number, lived in a deck-house forward, divided into two parts, called forecastles. When the captain became aware of the nature of the disease, he caused the men to move out and take up their quarters under the topgallant forecastle.

"Then all their clothing was put out to air, and the interior of the deck-house thoroughly fumigated for a number of days. So particular was the captain in his work, that the attention of passing vessels was called to the bright light proceeding from the bark, the result of burning tar and brimstone used as disinfectants."

Dr. Smith, the Health Officer of the Port, said to a reporter:

"I do not think there is any great danger of cholera getting in through this port. We are always on the watch for contagious diseases. This is the first vessel to come here this year with a real case of cholera on board. The hatches of the bark will be opened, her cargo shifted as far as possible, and she will be fumigated with gases, chlorine and sulphuric acid, according to the danger we think may be lurking about. The vessel will be disinfected again after the cargo is removed.

"I believe that the evident cause of the cholera that we have heard of for two years past has been latent germs, where the contagion has slumbered for months. I believe that the cholera in Spain this year came from germs that lay dormant from last year. Last year we had a vessel come into port with thirty cases on board. It did not get to the city, and I don't think they need have any fear now. We do not conduct our quarantine now by dates or arbitration. We do not keep a vessel for a stated time. That custom has gone by. We detain a vessel now until we believe that all danger of contagion has disappeared. With this Italian bark we shall be unusually careful. We shall only allow the vessel to go to her dock when we are completely assured that there is no further danger.

We shall fumigate her at the Hospital Island, where she now lies. We shall then quarantine her crew for a sufficient time below. Then the vessel can go to the upper quarantine above Staten Island, and discharge her cargo in lighters, when we shall again disinfect the ship. After a time she will be given a clean bill."

A Clean Bill of Health.

Deputy Health Officer Sanborn, who boarded the bark, said to a reporter:

"The Excelsior had a clean bill of health from the American Consul at Marseilles, who declares in the certificate that there was no sickness or cholera there at the time the bark sailed. Yet when two or three days out one of the crew died. The report of the case was that he died of cholera. He lived only one day after taking sick. The captain says there was no alarm among the crew. That was over two months ago, it must be remembered. The germs could remain on board or in the cargo for two years. The Excelsior had an assorted cargo, mostly of cased goods—Italian wines, fruits, etc. The bark came direct from Marseilles here. The captain did not touch at any other port. The captain speaks English and Italian. The man who died was a Neapolitan. We shall not keep the extra quarantine service open any longer than customary this year on account of the cholera in Spain, but will close the upper quarantine as usual. We keep the regular quarantine all the year."

It is altogether probable from this account by the master of the Excelsior, that he made the best use he could of the means at his disposal for the disinfection of his vessel.

He appears to have made use of the same means which Mr. Consul Mason, of Marseilles, and Dr. Bigelow, the Consulate Inspector at Berlin, describe as those under which cholera continues to spread in Europe, and seems destined to reach this country—means confessedly of no value as disinfectants.

Such means are worse than useless, and positively dangerous, in so far as they appear to arrest the development of the poison for a time, it may be, and so pave the way for its transportation and introduction into distant places. It is at least to be hoped that the disinfection of this vessel will be alike equal to the occasion and worthy of the quarantine service at this port, ere a clean bill of health is granted. The "sulphuring" of rags is persisted in abroad for the satisfaction of the rag mer-

chants, and *accepted, in great measure*, as sufficient by the port health officers of the United States, notwithstanding its declared worthlessness by those who supervise it, and the pronounced judgment of the International Sanitary Conference at Rome, that "*steam under pressure is the only reliable agent for the disinfection of rags.*"

According to information before us at the time of this writing, of nearly thirteen thousand bales of rags arrived at the port of New York during the month of September, less than one-tenth have been disinfected—*more than nine-tenths were admitted on having been "sulphured" abroad!* But this is not all.

Some, if not indeed many, cargoes of rags that have not even been "sulphured" have been admitted from infected ports. And about *twenty-five thousand bales* from Japan are now said to be afloat, bound for the port of New York. By reference to our editorial pages, it will be seen that small-pox was, at latest dates, and has been for the last six months, exceedingly prevalent in that country; that cholera has also prevailed to some extent; and that other infectious diseases portable by fomites have also been rife.

Is it possible that anyone who has intelligently watched the progress of cholera, and has carefully weighed the evidence of the means used for its prevention, as above described, can reflect upon such a distribution of dangerous fomites without grave apprehension? Yet it is continually going on, to the imminent risk of propagating cholera and small-pox.

But some sticklers for technicalities, who oppose the disinfection of rags, have claimed that there is no case on record in which *cholera* has been transmitted by means of *rags*. Even if this were true, the evidence we have submitted in preceding numbers, and that which is above given with reference to the communication of cholera to laundresses by means of soiled clothing of the sick, would be sufficient reason for requiring the disinfection of rags from suspected sources. Evidence is not wanting, however, even in this particular, sufficient to satisfy the most capricious intelligence when not swayed by interest.

Dr. George M. Sternberg, United States Army, in a letter to the *New York Medical Journal* (August 29, 1885), quotes from a letter he had received a few days before from Dr. Son-

denegger, President of the Swiss Aerzte Commission, and delegate from Switzerland to the International Sanitary Conference of Rome, as follows:

"The fact relating to rags was observed and described by Professor Biermer (living now in Breslau as Professor of Practical Medicine), and by Dr. Zehnder, Vice-Director of the Board of Health (Sanitätsrath), who were both most active at the time of cholera at Zurich in 1867: July, August, September, October—number of patients, 684; number of deaths, 65.9 per cent.

"Kriegstetten is a small village in the Canton of Solothurn, at eighty to one hundred kilometres' distance from Zurich, and not connected with this town either by water (lake, river, marsh) or by trade and industrial commerce. There is a paper-mill at Kriegstetten, and a workwoman, who had to tear the rags, was suddenly taken with cholera and died the following day. The following days sixteen more workwomen (all occupied in tearing the rags) were taken sick; of these, eleven died. A careful examination showed that all of these rags went from Zurich, and from cholera-houses; therefore, the whole mass of rags was disinfected by boiling. After this no case of cholera occurred. The large establishment of the paper-mill, as well as the village, remained free. I mentioned the fact in a little address to the Swiss people, which I have the honor to send you, and nobody doubted the fact or made any opposition. The fact was known everywhere in Switzerland."

That there are other *fomites* quite as dangerous as rags, in proportion to their magnitude, is doubtless true. In the words of the New York quarantine law:

"Clothing, personal baggage and dunnage, rags, paper-rags, hides, skins, feathers, hair, and all other remains of animals, cotton, hemp, and woollens," and the *ship* laden in whole or in part therewith, under suspected conditions of danger, are subject to obligatory quarantine and purification. But this does not detract in the least from the danger of rags, nor lessen the obligation to enforce the most certain measures of purification to everything.

That merchandise of every kind, and vessels especially, on exposure, are as liable to contract and retain cholera or small-pox infection as they are of yellow fever, no one familiar with

the subject will call in question. Moreover, that cholera and small-pox infections are at least as persistent and as difficult of destruction as the infection of yellow fever, is equally beyond question. Inasmuch, therefore, as there are frequently recurring examples of the conveyance of infectious diseases by fomites, and of the persistence of infection after "fumigation" and various solutions, as, for example, in the case of the bark John Gibson (published in preceding number), is it not high time that "the only reliable agent for the disinfection of rags" should be extended to other things equally difficult of disinfection—above all, to ships?

THE SANITARIAN has frequently urged *wet* steam as an efficient disinfectant when sufficiently applied, and described the simple process by which this has been done (vol. vii., p. 433 et. seq.); and recently (vol. xv., p. 254) described the apparatus, and the mode of applying superheated steam at a temperature of 330° F., or higher if desired, for the disinfection of rags and other bale merchandise. The same apparatus, we are satisfied, can be adapted to the disinfection of vessels, as well as to merchandise of all kinds, with greater facility to commerce, less injury to material, greater certainty, and at less expense, than any other means of thorough disinfection.

It is apparent that upon the Health Officer of the port of New York, more than upon anyone else, rests the responsibility of allowing dangerous fomites from abroad to be distributed throughout the country. And in view of the evidence now submitted of the propagation and continued expansion of both cholera and small-pox, under the means hitherto accepted as sufficient for their prevention, it is sincerely to be hoped that the health authorities throughout the country will require, and that the Health Officer of the port of New York will see to it, that no imported fomites, especially rags, shall be admitted to pratique without disinfection by the most reliable means at his command.

ANTISEPTICS.

By E. KLEIN, M.D., F.R.S.

THE presence of certain substances in the nutrient soil, the temperature, and some chemical products, such as those belonging to the aromatic series, phenol, indol, skatol, etc., is an essential condition, *cæteris paribus*, for the growth and multiplication of micro-organisms. Thus pathogenic organisms cannot thrive in an acid medium, they cannot thrive if proteids or allied compounds and certain inorganic salts are absent; putrefactive and zymogenic organisms, on the other hand, or, at any rate, some of them, are capable of thriving well in acid media (*e.g.*, the Bacillus subtilis in acid hay-infusion, the Micrococcus ureæ in acid urine). Further, many (not all) pathogenic organisms cannot thrive unless they are exposed to a certain degree of warmth; they thrive best at blood-heat, while putrefactive and many zymogenic organisms thrive well at ordinary temperatures, though of course their growth is more rapid at higher temperatures, such as 30° —38° C. Heat above 50° or 60° C. arrests the growth of and even kills many organisms, except the spores of bacilli, which survive even when exposed to the temperature of boiling water for several minutes. The presence of carbolic acid, phenol, thymol, salicylic acid, perchloride of mercury, etc., prevents even when in great dilution, the growth of micro-organisms.

In any inquiry into the influence of one substance or another on micro-organisms it is necessary to bear in mind that the influence of certain conditions on the micro-organisms may be a twofold one: (1) the condition may be unfavorable to the growth of the organism in question, and (2) the condition may be fatal to the life and existence of it. The second condition involves, *a fortiori*, the first; but the reverse is not the case. Owing to the failure to distinguish between these two propositions a great deal of confusion has arisen on the subject. One hears constantly of this or that substance as an "antiseptic," meaning by this a substance inimical to the life or micro-organ-

isms, or a substance is a "germicide," implying by this that this substance kills the organisms; but when one comes to analyze the observations that are said to establish this reputation for a particular substance, one finds that the substances in question are really only detrimental to the growth of the organisms.

By sowing any micro-organism into a nourishing medium, to which has been added a certain substance (*e.g.*, carbolic acid to the amount of one per cent.), and exposing this medium to the conditions of temperature, moisture, etc., otherwise favorable to the growth of the organism, if we find that after the lapse of a due period the growth is retarded or altogether inhibited, the conclusion is drawn that this substance (viz., the carbolic acid of one per cent.) is an antiseptic. There is nothing more fallacious than this method of reasoning; a great many micro-organisms can be exposed to a one-per-cent. solution of carbolic acid for hours without in the least being affected, for on being then transferred to a suitable nourishing medium they grow and thrive well. Similarly by placing the spores of Bacillus anthracis in a proteid medium containing perchloride of mercury of the strength of 1 in 300,000, it is found (as Koch has shown) that the spores are absolutely incapable of germinating. But if from this the conclusion is drawn, that perchloride of mercury of the strength of 1 in 300,000 is a germicide, I should most strongly dissent, for perchloride of mercury even of the strength of one per cent. is not a germicide any more than vinegar; for on placing the spores of Bacillus anthracis in a proteid medium, to which so much vinegar or any other acid has been added as makes it decidedly acid, it will be found that the spores do not germinate.

In order to pronounce a certain substance an antiseptic in the strict sense of the word, it is necessary to place the organisms in this substance for a definite time, then to remove them thence, and to place them in a suitable nourishing medium; if they then refuse to grow, the conclusion is justified that the exposure has injured or destroyed the life of the organisms. In the case of pathogenic organisms a substance to be pronounced a germicide must be shown to have this power, that when the organism is exposed to the substance and then introduced into a suitable artificial medium it refuses to grow; and it must

also be shown that when introduced into a suitable animal it is incapable to produce the disease which the same organism, unexposed to the substance in question, does produce.

I have made a good many observations on the influence of antiseptics on micro-organisms, both putrefactive and pathogenic, and I have found that many assertions hitherto made on this subject, treated in the above light, are absolutely untrustworthy and erroneous.

Various species of putrefactive micrococci, Bacterium termo, Bacillus subtilis, various pathogenic micro-organisms, as Bacillus anthracis, bacillus of swine fever, absolutely refuse to grow in media to which is added phenyl-propionic acid, or phenyl-acetic acid, to an amount so small as 1 in 1,600; but if the same organisms are exposed to these substances in much stronger solutions, 1 in 800, 1 in 400, or even 1 in 200, and then transferred to a suitable nourishing material, it is found that they have completely retained their vitality, they multiply as if nothing had been done to them. I have exposed the spores of Bacillus anthracis to the above acids of the strength of 1 in 200 for forty-eight hours and longer, and then inoculated guinea-pigs with them, and I found that the animals died of typical anthrax in exactly the same way as if they had been inoculated with pure spores of the Bacillus anthracis.

Koch* has published a large series of systematic and most valuable observations, made in testing the influence on spores of Bacillus anthracis of a large number of antiseptics (thymol, arsenite of potassium, turpentine, clove-oil, iodine, hydrochloric acid, permanganate of potassium, eucalyptol, camphor, quinine, salicylic acid, benzoic acid, and many others), and among them he found perchloride of mercury to be the most powerful, since even a solution of 1 in 600,000 is capable of impeding, one of 1 in 300,000 of completely checking, the germinating power of the spores. To regard these substances, from these observations, in any way as antiseptics for the spores of Bacillus anthracis would be no more justifiable than to consider weak vinegar as such. Perchloride of mercury in a solution of 1 in 300,000 is no more capable of interfering with the life and functions of the spores of Bacillus anthracis

* Mittheil. aus d. k. Gesundheitsamte, Berlin, 1881.

than water or salt solution, for the spores may be steeped in this solution for any length of time, and yet on being transferred to a suitable medium they grow and multiply splendidly, and when inoculated into rodents they produce fatal anthrax with absolute certainty. With my friend, Dr. Blyth, Medical Officer of Health for the Marylebone District in London, I have tried the action of a number of substances in common use as antiseptics (*e.g.*, Calvert's fluid, pure terebene, phenol, ten per cent.; perchloride of mercury, one per cent.), on the spores of Bacillus anthracis, exposing these in comparatively large quantities of the above fluids (the two being well mixed) for twenty-four hours, and then inoculating guinea-pigs with them (spores and antiseptic). The animals died with symptoms of typical anthrax, the blood teeming with the Bacillus anthracis.

These substances, then, are no more antiseptics, and still less germicides, for the spores of Bacillus anthracis than water is.

In all these inquiries, particularly in those upon pathogenic organisms capable of forming spores, the influence of the substances must be judged not merely by their action on the organisms, but also on the spores; for, in this very case of the Bacillus anthracis, the bacilli taken from the blood of an animal dead of anthrax are killed after an exposure of say ten minutes to a solution of phenyl-propionic acid of the strength of 1 in 400, or even 1 in 800, whereas the spores of the bacilli (produced in artificial cultures) withstand completely exposure to this acid of any strength and for any length of time.

It is not my object to pass here in review all that has been done in this interesting field of research, important because of its obviously great practical importance. The work hitherto done has been enormous, but, I fear, of less utility than at first sight appears, for in most of it the point most prominent in the mind of the worker was to ascertain whether the particular antiseptic, mixed with the nourishing medium in a solution of definite strength, has or has not the power of inhibiting the growth of the micro-organisms. This point, no doubt, is of some interest, and perhaps of great interest; but whether a particular substance is an antiseptic in the proper sense of the word, *i.e.*, whether on exposing the organisms to this substance in a solution of definite strength and for a definite

period the organisms become afterward incapacitated from growing or multiplying; or, still more, whether or not the substance is a germicide, *i.e.*, is capable of altogether annihilating the life of the organisms—these are questions which require special attention, and represent a wide and rich field of inquiry; but, so far as I can see, it has received only in very few instances due attention.—*The Practitioner.*

VALUE OF AN ABSCESS.—A certain physician of a Western town is trying to sell an abscess upon the posterior part of his anatomy to a railway company for $10,000. The circumstances of this most interesting case, as related by an exchange, are as follows: The doctor boarded a train of the Cincinnati, Indianapolis, St. Louis & Chicago Railway, in October last, to go to a Democratic meeting in Indianapolis. The cars being well filled by pilgrims wending to the same shrine, Dr. Washburn went into the baggage-car and sat down, not only upon an egg-crate, but also upon a nail which protruded from the said crate, and entered, penetrated, and pierced that portion of the doctor's body which must necessarily come into use if one sits down at all. It further appears that the railway company had negligently omitted to scour this nail with brick or sand-paper, and had permitted it to become rusty. The result of the puncture, it is alleged, was an abscess, which caused the doctor great trouble, and even endangered his life. As a plaster to this wound, he now asks the railway company to pay him $10,000, and has called upon the court to enforce his request. The case is full of fine points—fuller of them than the egg-crate. Did the company invite and request the physician to enter the baggage-car and sit down on the egg-crate? Is it the duty of the company to polish up the nails in the egg-crates which it carries? Should not the doctor have looked out for nails before he sat down? Was the sore really an abscess, or only an old-fashioned boil? Was the doctor's blood in good order when he sat down on the nail, or did he inflame it unnecessarily by getting mad, and prancing around in warm weather, when he discovered that the nail had gone where it ought not? Can a man's blood be in good order in the midst of a "heated" Presidential campaign, and when he is on his way to a big political

meeting? Might not the doctor in his enthusiasm have taken that method of nailing his colors to the mast, and only became sorry for it when inflammation ensued? Altogether the case embraces many very interesting medico-legal questions, and will, no doubt, result in settling many points hitherto undecided. It is a case of which it may truly be said that there is a point in it.—*Railway Age.*

LIFE EXPECTATION IN CANADA.—*The Montreal Journal of Commerce* thinks that the experience of the life companies in Canada has been large enough to furnish an independent mortality table, and that the work ought to be undertaken. It says: "If, as we believe, our mortality is lower than the mortality in the United States, we would by all means like to have the fact demonstrated beyond any doubt. Our plea, that the frugality, carefulness, and industry of Canadians make them more desirable as insurance risks than residents of most other countries, would thus either be dispelled as an illusion or confirmed beyond any further doubt or question. Our premium rates, that are lower than the rates charged by conservative companies in other countries, would thus receive their condemnation or would be verified as abundantly large enough to cover our risks. In any event, it would be a good thing to settle this question beyond the shadow of a doubt, and therefore—having the interests of our home companies at heart—we say, let us, by all means, have a Canadian table of mortality.

DANGEROUS BEER.—Drs. Bartley and Edson, respectively of the Health Departments of Brooklyn and New York, have recently shown that the use of brass faucets in beer-kegs is liable to generate verdigris; and that the use of such faucets should therefore be prohibited.

A GOOD STROKE IN STATE MEDICINE.—Dr. E. O. Shakespeare, of Philadelphia, has been appointed by the President United States commissioner to visit the cholera-infected districts in Europe, with a view to such investigations as may be made useful for the prevention and management of cholera.

WHAT IS THE EXPLANATION OF ACQUIRED IMMUNITY FROM INFECTIOUS DISEASES?

By GEORGE M. STERNBERG, M.D., Major and Surgeon, U. S. A.

IT is well known that in the specific infectious diseases of man and of the lower animals a single attack commonly confers immunity from subsequent attacks. There are, however, numerous exceptions to this rule, and the immunity conferred is not absolute, but has a variable value, which depends partly upon individual susceptibility, partly upon the physical vigor of the individual when subsequently exposed, and partly upon circumstances relating to the nature of the exposure—*e.g.*, concentration of poison, mode of infection, etc. There is also evidence that, in some cases at least, the time which has elapsed since a first attack is an important factor in determining immunity when a subsequent exposure occurs. Even in small-pox and in yellow fever, diseases in which a single attack is in most cases protective during the lifetime of the individual, fatal second attacks occasionally occur. Nevertheless, the general law of immunity as a result of a single attack is well established for a majority of the acute infectious diseases.

It is evident that the immunity which results from inoculation with an "attenuated virus"—as, for example, in Pasteur's protective inoculations against anthrax, or from vaccination—is of the same nature, and that a satisfactory explanation must include all established facts of this class. Upon taking a broad view of the question, it will be seen that it includes also the facts relating to relative race immunity, such, for example, as the comparative mildness of yellow fever in the negro, the alleged liability of the Esquimaux to suffer a fatal attack of small-pox as a result of vaccination (Grawitz), the immunity of Algerian sheep from anthrax, etc.

Naturally this question has attracted the attention of the leading investigators in the field of experimental pathology, for its inherent interest and practical importance are apparent. Three explanations have been offered to account for the phe-

nomena in question, which may be stated as follows: 1. The "exhaustion theory," advocated by Pasteur, which supposes that some substance present in the body of a susceptible individual up to the time of a first attack, and which is essential for the development of the specific germ of the disease, is exhausted during the attack, and that consequently this particular germ is unable subsequently to multiply in the body of this individual. 2. The "antidote theory," advocated by Klebs and recently supported by Klein.* This theory supposes that some chemical substance is produced during the attack which is inimical to the development of the germ, and which, remaining in the body of the animal, prevents its subsequent development. 3. The vital resistance theory, which supposes that immunity is due to an acquired tolerance on the part of the living cellular elements of the body to the poisonous products evolved by disease germs, to which they probably owe their pathogenic power, and a consequent ability to resist invasion by them. According to this view individual and race differences in susceptibility, as well as the more or less perfect immunity resulting from a single attack of any one of the specific infectious diseases, are phenomena depending upon differences in vital resisting power, either inherited or acquired. The last-mentioned theory is referred to by Klein in his recent work on "Micro-organisms and Disease" in the following language: "Some observers (Grawitz, etc.) are not satisfied with this theory [the antidote theory], but assume that, owing to the first attack, the cells of the tissues so change their nature that they become capable of resisting the immigration of a new generation of the same organism. There is absolutely nothing that I know of in favor of such a theory; it is impossible to imagine that the cells of the connective tissues, of the blood, and of other organs, owing to a past attack of scarlatina, become possessed of new functions or of some new power—as, for instance, a greater power of oxidizing, or the like."

As the present writer is perhaps included in the "etc." ("Grawitz, etc.") of the above quotation, he feels called upon to say something in favor of the theory thus summarily disposed of, which seems to him to be the only one thus far offered

* Micro-organisms and Disease, Practitioner (London), vol. xxxiii., No. 4, p. 249.

which is at all tenable, and which he advocated in the article published in the *American Journal of the Medical Sciences* of April 1, 1881, which has the precedence over the paper by Grawitz by a few days, the latter having appeared in *Virchow's Archiv* on the 8th of the same month. In order that the two explanations which I reject as untenable may be fairly presented to the readers of the present paper, I shall quote verbatim the arguments advanced in their support by their most prominent advocates.

The first hypothesis (1) is supported by Pasteur in the following language: "It is the life of a parasite in the interior of the body which produces the malady commonly called 'choléra des poules,' and which causes death. From the moment when this culture (*i.e.*, the multiplication of the parasite) is no longer possible in the fowl, the sickness cannot appear. The fowls are then in the constitutional state of fowls not subject to be attacked by the disease. These last are as if vaccinated from birth for this malady, because the fœtal evolution has not introduced into their bodies the material necessary to support the life of the microbe; or these nutritive materials have disappeared at an early age. Certainly one should not be surprised that there may be constitutions sometimes susceptible and sometimes rebellious to inoculation—that is to say, to the cultivation of a certain virus, when, as I have announced in my first note, one sees a preparation of beer yeast made exactly like one from the muscles of fowls (bouillon) to show itself absolutely unsuited for the cultivation of the parasite of fowl cholera, while it is admirably adapted to the cultivation of a multitude of microscopic species, notably to the bactéride charbonneuse (bacillus anthracis). The explanation to which these facts conduct us, as well of the constitutional resistance of some individuals, as of the immunity produced by protective inoculations, is only natural when we consider that every culture in general modifies the medium in which it is effected; a modification of the soil when it relates to ordinary plants; a modification of plants and animals when it relates to their parasites; a modification of our culture liquids when it relates to 'mucédines,' 'vibrioniens,' or ferments. These modifications are manifested and characterized by the circumstance that new cultivations of the same species in these media become promptly

difficult or impossible. If we sow chicken bouillon with the microbe of fowl cholera, and, after three or four days, filter the liquid in order to remove all traces of the microbe, and subsequently sow anew in the filtered liquid this parasite, it will be found quite powerless to resume the most feeble development. The liquid, which is perfectly limpid after being filtered, retains its limpidity indefinitely. How can we fail to believe that by cultivation in the fowl of the attenuated virus we place its body in the state of this filtered liquid, which can no longer cultivate the microbe? The comparison can be pushed still further; for, if we filter the bouillon containing the microbe in full development, not on the fourth day of culture, but on the second, the filtered liquid will still be able to support the development of the microbe, although with less energy than at the outset. We comprehend then, that after a cultivation of the modified (*atténué*) microbe in the body of the fowl, we may not have removed from all parts of the body the aliment of the microbe. That which remains will permit a new culture, but in a more restricted measure. This is the effect of a first inoculation; subsequent inoculations will remove progressively all the material necessary for the development of the parasite." *

In commenting upon Pasteur's explanation of acquired immunity in the chapter on "Bacteria in Infectious Diseases" in my recent work I remark: † "It is a little surprising that after disproving by the experimental method the hypothesis last mentioned"—viz., the antidote theory adopted by Klein—"which had been proposed by a member of the French Academy in explanation of the phenomenon in question, Pasteur did not, in accordance with his usual custom, attempt to establish his own hypothesis upon a firm foundation by an experiment which at once suggests itself. If a fowl which is protected against cholera, or an animal which is protected against anthrax, owes this protection to the fact that a certain material which is required for the development of the microbe of fowl cholera, or for the anthrax bacillus, has been exhausted in the course of the modified form of the disease to which immunity is due, then the flesh of such an animal made into bouillon

* Comptes Rendus, Acad. des Sciences, xc., p. 952.

† Bacteria; Wm. Wood & Co., New York, 1884.

should not constitute a proper culture medium for the organisms in question. The writer ventures to predict that the result of such an experiment would not be favorable to Pasteur's hypothesis, and that it will be found that the micrococcus of fowl cholera can be cultivated in bouillon made from the flesh of a protected animal, and that the bacillus of anthrax may multiply freely in the blood, or in an infusion of the flesh, of an animal which, before it was killed for the experiment, possessed immunity against the disease anthrax." *

Since the above was written, Salmon in the United States, and Klein in England, have reported the results of experiments which show that the prediction made was well founded.

Salmon says, in a recent communication to *Science*: † "I trust, however, you will pardon me for calling your attention to the fact that more than two years ago I demonstrated that immunity was only relative, never absolute; that the most susceptible individual possessed a certain degree of immunity which can be accurately measured; and that all degrees of immunity may be overcome by a sufficient increase in the dose of virus. The immunity of the animal body, then, in no sense resembles the exhausted cultivation liquid in the flasks of Pasteur and Tyndall, which no increase in the amount of virulent material added can ever induce to support the development of new generations of the microbe, and the honor of demonstrating this radical difference is due to American investigations. I went further than this, however, and showed that this theory of our European friends was absolutely untenable, because broth made with distilled water from the flesh of an animal that had been granted a very complete immunity was just as favorable a medium for the growth of the virus as that made from susceptible animals; and that such virus lost nothing in virulence by being grown in such a medium. I will not trouble you with the theory of immunity which I developed from these experiments. Like other American work, it may have no value; but it may interest you to know that an able German writer, in the last number of *Virchow's Archiv*, has propounded a theory which in its most important points is identical with my own."

* Op. cit., p. 245.

† September 26, 1884, p. 303.

In referring to this theory as his own, Salmon seems to have overlooked the fact that I offered the same explanation of acquired immunity in my paper, already referred to, which was published in the *American Journal of the Medical Sciences* for April, 1881.

Klein says, with reference to the exhaustion theory :—" On careful analysis it will be found that it is not capable of explaining the facts of the case. As we mentioned in a former chapter, cattle inoculated with blood of a guinea-pig dead of anthrax become affected with anthrax, which, although not fatal, is nevertheless sometimes very severe. The animal recovers, and is now, for a time at least, secure against a second attack. But there is absolutely no ground for the assumption that if an infusion of the tissues of this animal were made the bacillus anthracis sown in it would not thrive luxuriantly, seeing that bacillus anthracis grows upon almost anything that has a trace of proteids. Similarly, when of the tissues of a guinea-pig, or mouse, or rabbit, dead of anthrax, an infusion is made, and this is used as nourishing material for bacillus anthracis in artificial cultures, it is found that these latter thrive splendidly. There is, then, no reason whatever for assuming that, after one attack of illness the blood and tissues become an unfavorable soil for a second invasion of the same organism, and that this change is due to the exhaustion of some necessary chemical compound."

In my own paper, heretofore referred to, in the absence of experimental data I argue as follows :—" Let us see where this hypothesis leads us. In the first place, we must have a material of small-pox, and a material of measles, and a material of scarlet fever, etc. Then we must admit that each of these different materials has been formed in the system and stored up for these emergencies—attacks of the diseases in question—for we can scarcely conceive that they were all packed away in the germ-cell of the mother and the sperm-cell of the father of each susceptible individual. If, then, these peculiar materials have been formed and stored up during the development of the individual, how are we to account for the fact that no new production takes place after an attack of any one of the diseases in question? Again, how shall we account for the fact that the amount of material which would nourish the small-pox

germ to the extent of producing a case of confluent small-pox may be exhausted by the action of the attenuated virus (germ) introduced by vaccination? Pasteur's comparison of a fowl protected by inoculation with the microbe of fowl cholera with a culture fluid in which the growth of a particular organism has exhausted the pabulum necessary for the development of additional organisms of the same kind, does not seem to me to be a just one, as in the latter case we have a limited supply of nutriment, while in the former we have new supplies constantly provided of the material (food) from which the whole body, including the hypothetical substance essential to the development of the disease germ, was built up prior to the attack. Besides this, we have a constant provision for the elimination of effete and useless products. This hypothesis, then, requires the formation in the human body, and the retention up to a certain time, of a variety of materials, which, so far as we can see, serve no purpose except to nourish the germs of various specific diseases, and which, having served this purpose, are not again formed in the same system, subjected to similar external conditions, and supplied with the same kind of nutriment."

It hardly seems worth while to give further attention to this explanation, offered by the great chemist to whom we owe so much, but who, if we may judge from his reasoning in this instance, is not equally great as a physiologist. We proceed, therefore, to consider hypothesis No. 2.

That full justice may be done to the "antidote theory," I quote fully from the latest authority who has written in its favor. Klein says: "There is another theory, commonly spoken of as the 'antidote theory' (Klebs). According to this the organisms growing and multiplying in the body during a first attack produce, directly or indirectly, some substance which acts as a sort of poison against a second immigration of the same organism. I am inclined to think that this theory is in harmony with the facts. There is nothing known from the observations before us which would negative the possibility of the correctness of this theory; nay, I would almost say all our knowledge of the life of the micro-organisms points to the conclusion that the different species are associated with different kinds of chemical processes, and that as a result of the activity

we find different chemical substances produced.* The different fermentations connected with the different species of fungi afford striking illustrations of this view. According to this theory we can well understand that, just as in the case of an animal, say a pig insusceptible to anthrax, the insusceptibility being due to the presence in the blood and tissues of a particular chemical substance inimical to the growth of the bacillus anthracis—so also in the case of a sheep or ox that has once passed through anthrax—there is now present in the blood and tissues a chemical substance inimical to the growth and multiplication of the bacillus anthracis, whereby these animals become possessed of immunity against a second attack of anthrax. Whether this chemical substance has been elaborated directly by the bacilli, or whether it is a result of the chemical processes induced in the body by the bacilli during the first illness, matters not at all; it is only necessary to assume that the blood and tissues of the living animals contain this chemical substance. Some observers (Grawitz, etc.) are not satisfied with this theory, but assume, etc.† . . . . On the whole, then, we may take it as highly probable that, owing to the presence in the normal blood and tissues of a living animal of a chemical substance inimical to the growth of a particular micro-organism, this animal is insusceptible to the disease dependent on the growth and multiplication of this micro-organism; and, further, that in those infectious maladies in which one attack gives immunity against a second attack of the same kind, one attack produces a chemical substance in the blood and tissues which acts inimically to a new immigration of the same organism; hence the animal becomes insusceptible to a new attack, or is 'protected.' This is not the case with all infectious maladies, for, as is well known, in a good many instances a single attack does not protect against a second; and, as is also well known, a first attack may protect only for a limited period, or for a period greatly differing in different individuals. All this would be explained by our theory in the same way as it is explained by the other theories—viz., when one attack does not protect, no inhibitory chemical substance has been produced; while in those diseases in which one attack does protect only for a limited period, the

* This is beyond dispute.—G. M. S.

† Already quoted, see *ante*.

necessary inhibitory substance has only lasted for a limited period, and so on." *

It is unnecessary to point out that Klein simply states and reiterates his own opinion in all that he says with reference to the theory which he favors, and that no experimental evidence is adduced in support of this opinion, nor, I may say, any arguments worthy of consideration; yet it would seem that, as in the case of the first hypothesis, a very simple experiment should decide whether this view is tenable. Fortunately, the experimental evidence which shows that it is untenable is at hand, and has been furnished in part by Klein himself.

It is difficult to understand the kind of reasoning which excludes Pasteur's hypothesis upon the ground that the anthrax bacillus multiplies freely in the blood of an immune animal, or in an infusion of the flesh of an animal dead of anthrax, but which supposes that a chemical poison present in the tissues prevents the development of the bacillus in the protected animal. What, then, has become of this poison when the blood of such an immune animal is drawn from its veins into a test-tube, or in the infusion made from the flesh of a recent victim of anthrax? We might possibly admit that the hypothetical chemical substance which remains for years in the blood and tissues of an immune animal, notwithstanding the elaborate provision made by nature for the excretion of useless or injurious products, is dissipated by boiling in the infusion made from the flesh of the animal; but this assumption will not apply to blood freshly drawn from its veins, which also furnishes an admirable culture-medium for the anthrax bacillus. But even this possibility has been disproved by Pasteur, who has given the *coup de grâce* to the antidote hypothesis by the following experiment. He says, "Is this the only possible explanation of the phenomenon?" referring to the exhaustion theory. "No, we may admit the possibility that the development of the microbe, in place of removing or destroying certain matters in the bodies of the fowls, adds, on the contrary, something which is an obstacle to the future development of this microbe. The history of the life of inferior beings authorizes such a supposition. The excretions resulting from vital processes may

* Op. cit., p. 249.

arrest vital processes of the same nature. In certain fermentations we see antiseptic products make their appearance during, and as the result of, the fermentation, which put an end to the active life of the ferments, and arrest the fermentations long before they are completed. In the cultivation of our microbe products may have been formed the presence of which possibly may explain the protection following inoculation. Our artificial cultures permit us to test the truth of this hypothesis. Let us prepare an artificial culture of the microbe, and after having evaporated it *in vacuo*, without heat, let us bring it back to its original volume by means of fresh chicken bouillon. If the extract contains poison to the life of the microbe, and if this is the cause of its failure to multiply in the filtered liquid, the new liquid should remain sterile. Now this is not the case. We cannot, then, believe that during the life of the parasite certain substances are produced which are capable of arresting its ulterior development." *

If Pasteur's experiment, which relates to fowl cholera only, is not considered conclusive, let us consider the tax upon our credulity which this hypothesis involves. In the first place, the individual who has suffered attacks of several different infectious diseases—as, for example, of small-pox, measles, scarlet fever, yellow fever, etc.—has stored up in his blood and tissues as many distinct chemical substances as there are diseases in the list, each of which was produced by the development of a specific microbe in his body. These poisons in no way harm the individual, and no one of them, or even the combined action of several, has any effect in preventing the development of other pathogenic microbes of the same class. How different this from the action of known antiseptics, which act in a similar manner, although not in all cases in equal amounts, in restricting the development of all micro-organisms, pathogenic or non-pathogenic, of the class to which known disease germs belong. And how improbable it is that certain substances exist capable of preventing the development of these low organisms in the animal body, which are not injurious to the higher and more sensitive organism, when all our laboratory experiments go to show that the most potent "germicides" and antiseptics are

* Op. cit.

poisonous agents, which are capable of destroying animal life in a relatively smaller proportion than is required for the destruction of "germs." Moreover, we are to believe that these several poisons remain indefinitely in the ever-changing blood and tissues, and that normal physiological processes, by which waste products formed in the cell laboratories of the body are quickly removed from the circulation, are impotent for the excretion of these very peculiar poisons, although non-lethal doses of potent vegetable and mineral poisons are known to be removed from the body in a comparatively short time. We are also required to believe that during the development of a vaccine vesicle in an infant a poison is formed, inimical to the development of the small-pox germ, in such quantity as to afford it protection during the period of its growth and maturity, and perhaps during a long life. In short, the difficulties in the way of accepting this explanation seem to be quite equal to those involved in the "exhaustion theory," and we are obliged to look further for an explanation of the phenomena in question.

As already stated, the explanation which seems to the writer most satisfactory, and most in accordance with the facts, is that which has been denominated "the vital resistance theory." It is well known that living tissues resist the invasion of putrefactive organisms, while dead tissues quickly fall into putrefactive decomposition. So, too, blood within the vessels of a living animal does not behave like the same fluid in a test-tube, but in some way disposes of the bacteria of putrefaction when they are injected into the circulation, instead of nourishing them and being decomposed by them. Perhaps the histological elements of the vital fluid which exhibit the greatest vital activity—namely, the leucocytes—may be directly concerned in removing from the circulation bacteria which are introduced experimentally on those pathogenic or harmless organisms which by accident find their way into the blood. However this may be, it is evident that the blood and tissues of a living animal resist putrefaction by virtue of their vitality, and we are justified in using the term "vital resistance" in explaining the immunity of certain animals (acquired), or of certain races (inherited), to the invasion of certain pathogenic micro-organisms belonging to the same class as that which includes the bacteria of putrefaction, although we may not be able to explain the

modus operandi of this vital resistance or to define exactly what vitality is. We know, at least, that vital phenomena are exhibited by a special kind of matter called protoplasm, and that the living portion of the histological elements of the blood and tissues is composed of the complex nitrogenous substance which has received this name. We know, too, that this living matter, although apparently the same in its gross chemical and physical structure wherever found, has the most varied vital characters, which have been transmittted to it by living matter of the same kind from which it is derived. The special vital characteristics of each bit of protoplasm, enclosed in a cell-wall or otherwise, are manifested during its growth, and, as is well known, certain cells—as, for example, the fertilized ovum of a mammal—develop into most complex organic structures; while others, as in the case of a micrococcus or a yeast-cell, simply produce other cells like themselves. Not only are the characters which distinguish one species of animal or plant from another transmitted in this way, but individual characteristics may be transmitted in like manner, especially those of a vital or physiological order—such as a feeble or robust nervous or digestive system, a tendency to long life or to premature decay, vital resistance to morbific influences, etc.

As examples of inherited physiological peculiarities of the order last mentioned, I may refer to the predisposition in some families to diseases of the nervous system—insanity, epilepsy, and the like—to the vulnerability of others to tuberculous infection, to the small-pox poison, etc., and to the very feeble vitality of many children born of parents whose vigor has been impaired by excesses or disease, and which causes them to fall victims to the first devitalizing agent with which they come in contact. On the other hand, we have numerous examples of unusual individual or family resisting power to specific morbific agents, and this is still more marked in certain well-defined varieties or races of man and of the lower animals. Thus, the negro, as already mentioned, is less subject than the white man to severe forms of malarial fever and to yellow fever; the Algerian sheep has an exceptional immunity from anthrax; the fatal form of septicæmia in the mouse, which Koch has so well studied, affects only house-mice, while field-mice are not susceptible to it. But, in addition to these inherited differ-

ences in vital resistance to various morbific agents, it is well known to physicians that wide differences in susceptibility to the action of these agents result from influences which lower the individual standard of vitality, temporarily or permanently. Among the most prominent of these influences may be mentioned hemorrhage, chronic wasting diseases, excessive fatigue, inanition, venereal or bacchanalian excesses, etc. This is shown in a striking manner during the epidemic prevalence of pestilential diseases, which find their victims especially among those whose vital resistance is "below par" from one of the causes above mentioned.

The absolute immunity which certain species of animals have against the infectious diseases of other species is probably due in great part to causes of a different order, and is to be attributed to constant (specific) differences in the chemical composition of the tissues and fluids, and to differences in the normal temperature of the body, etc., which constitute favorable or unfavorable conditions for the development of particular pathogenic organisms. But this is quite a different matter from the relative immunity which results from a single attack of one of the infectious diseases, which may in certain cases be overcome by unusually large doses of the disease poison, by exposure when the general health of the individual is at a low standard—deficient vital resistance of a temporary nature—or by an unusual individual susceptibility—"idiosyncrasy." There can be no doubt, then, that differences in vital resisting power do exist which determine the development or otherwise of a first attack after exposure to infection in those diseases in which one attack is to a greater or less extent protective; but this does not explain the immunity which follows such an attack. This I believe to be due to an increased vital resistance to the specific disease poison—probably not to the germ, but to the chemical products evolved as a result of its vital activity, and which give it pathogenic power—resulting from a tolerance to this poison acquired during the attack, when it must be present in the system in considerable quantity.

We have numerous examples of acquired tolerance to the action of known toxic agents, and especially to those which act chiefly upon the nervous system—*e.g.*, opium, tobacco, arsenic. And there is evidence that disease poisons produce

the morbid phenomena which characterize the acute infectious diseases, in part at least, by their action upon the nervous system. The febrile phenomena, for example, are no doubt largely due to the action of some toxic agent upon the nervous system; and the chemical explanation of fever, which supposes that it corresponds with the rise in temperature observed in a liquid undergoing fermentation, is as crude as is the chemical explanation of immunity. Evidently, if the explanation is correct thus far, the vital resistance of which I speak is a property of the living matter or protoplasm of the body, and resides in the cellular elements of the tissues—nerve-cells, gland-cells, muscle-cells, leucocytes, etc. Now, these cells are not fixtures like bricks in a house, but are constantly being replaced by other cells. Their progeny, which in their turn grow old, die, and give way to younger generations. It is therefore necessary to suppose, in order that this explanation may cover the fact of a continued immunity for many years, that the tolerance acquired during an attack by the cellular elements of the body is transmitted to their cellular progeny through successive generations. This supposition will not overtax the credulity of biologists and of physiologists, for they are familiar with the wonderful power which protoplasm has of transmitting its peculiar vital properties, inherited or acquired, to its offshoots.

The vegetable kingdom furnishes us excellent examples of the transmission of acquired properties through successive generations of cells. Cultivated varieties of fruits and flowers are propagated by slips, buds, or grafts. The cellular elements of each bud or graft are in this case the direct progeny of those in the first cutting, which was selected because of some peculiarity which it was desired to propagate. But if we plant the seed produced by such a bud or slip, we do not obtain the peculiarities of fruit, flower, or foliage which we had preserved by the first mentioned method. In like manner acquired immunity from infectious diseases, and acquired physiological or structural peculiarities generally, are not transmitted through the reproductive elements of an individual to his offspring, at least not to an extent at all comparable with the transmission of race or family peculiarities. How, then, are these race or family peculiarities established? Darwin has answered this

question in a most satisfactory manner for plants and animals in a state of nature. There are congenital differences in the progeny of the same parents which give character to the individual and which are to a greater or less extent transmitted to his offspring. "The survival of the fittest" has a constant tendency to perpetuate advantageous peculiarities, and these are intensified in succeeding generations by the action of the same general law of natural selection. It is by the action of this law that we explain acquired race immunity, as, for example, the superior tolerance of the negro to the action of malaria. Living in a intensely malarious region, a race tolerance has been established for this poison by natural selection and the survival of the least susceptible individuals. In this case we cannot explain the superior tolerance to the malarial poison by supposing that acquired individual tolerance has been transmitted and has become a race character, for the malarial poison is peculiar in that one attack not only does not protect, but constitutes a predisposition to subsequent attacks. I am disposed to explain in a similar manner the marked difference in susceptibility to infectious forms of septicæmia, which is exhibited by carnivorous and herbivorous animals. The herbivora are especially susceptible to these septic germ diseases, which are propagated by inoculation and are known to us mainly by laboratory experiments. It is evident that in a state of nature they are little liable to accidental inoculation with septic material containing the various organisms associated with putrefactive decomposition, and consequently there has been no opportunity for the establishment of race immunity by the survival of the least susceptible. The carnivora, on the other hand, are frequently forced, in a state of nature, to feed upon putrefying animal bodies, and in their battles over such prey must constantly wound each other with teeth or claws smeared with material containing septic organisms. If wolves were as susceptible as rabbits to the forms of septicæmia referred to, it would appear that the species could not long escape destruction. But this is not the case, and I can scarcely doubt that their immunity is the result of the survival of the least susceptible through successive generations; or, in other words, is due to natural selection.—*The Lancet.*

THE SO-CALLED "PLEURO-PNEUMONIA" IN NEW JERSEY.

FROM the Philadelphia *Record*.—"Much excitement has been occasioned among the farmers in the vicinity of Pavonia, on the northern outskirts of Camden, by the appearance of pleuro-pneumonia in the herd of cattle on the farm of Mr. Feenfer. Drs. Miller and Dyer, of the State Board of Health, have investigated the outbreak, and believe that the rigid quarantine which they have established will prevent the spread of the disease. The herd of nine cows was purchased last February at the West Philadelphia Stock Yards. Two of the infected animals have been killed and the remainder inoculated."

From the Philadelphia *Times*.—"A general examination is being made of herds of cattle in Camden and Gloucester Counties by Drs. W. B. E. Miller and C. K. Dyer, of the New Jersey State Board of Health. On the farm of M. Feenfer, at Pavonia, near Camden Water-Works, a herd of nine cattle is infected with pleuro-pneumonia. The disease was brought to the farm by three or four cows, which were purchased by Mr. Feenfer at the West Philadelphia Stock Yards in February last. Great care will be taken by the authorities to prevent the spread of the disease, and the herd has been quarantined."

On reading the above we at once went to Camden, N. J., where we procured a conveyance and proceeded to the farm referred to above, near Pavonia, a distance of about three miles from the City Hall, Camden. There are about fifty dwellings scattered about this place. On our way there we met the two veterinary surgeons of the New Jersey State Board of Health, Drs. Miller and Dyer, returning from the Feenfer farm, where they had been visiting the sick cows. On our arrival at Michael Feenfer's place, about 10 A.M., we found Mr. Feenfer, the "farmer" referred to, was away with his milk-wagon, selling milk from the cows not yet dead or dying, and would not return before 11.30 A.M., so we were introduced to his son, a young man about seventeen years old, who very kindly showed us all the surroundings of the place.

The "farm" referred to consisted of about four town lots,

on which there is one dwelling-house and out-houses, one cow-stable, one cow-shed, a hog-pen, and a hen-house. These lots were situate about one-half mile from the Delaware River, on rather low ground.

We found the cow-stable about sixteen by twenty-four feet, with eight stalls on each side, three feet wide. The door opened out into the cow-shed, which was about the same size as the stable and open on one side. The stable was low and had loose boards placed overhead, where hay was kept for food. There was also a window that opened out into the yard, which window and door were the only means of ventilation provided. Just in front of this window and door was a cess-pool, about fifteen feet in diameter, that took up the drainage and filth from the cow-stable, hog-pen, and hen-house, as well as the drainage from the dwelling and all the out-houses. This cesspool was full of the very worst of filth. The liquid was as black as tar, and it had recently been filled with swamp and bog-sods, with long weeds and grass, as they said, "to keep the cows from miring." In the stable was found but one cow, the rest of the stalls were full of all sorts of trash and filth. The shed was in like condition—only worse. We opened up our inquiries as follows:

How many cows have you?—"We had thirteen."

How many have you now?—"Six and the sick one."

What became of the others?—"Four died, one we sold, and one we gave away."

Where are the six?—"In the pasture."

How did your cows get sick?—"We bought one cow from the West Philadelphia Stock Yard about two months ago, and about a week after she had a calf, and about two days after that she took sick and died."

What was the matter with her?—"The cow-doctors said she had pleuro-pneumonia, and that she caught the disease in the Stock Yard."

Did the calf get sick and die?—"No, the calf was healthy."

What did you do with the calf?—"We sold it to the butchers."

Were there any cows sick in the Stock Yard when you bought this one?—"Not as we can learn."

Had there been any sick before, or has there been any sick there since?—"No, not as we can learn."

How many acres of land have you in your farm?—"We have no land, only these lots; we rent pasture."

How many acres do you rent?—"We rent about three acres for pasture, and pay $65 for it."

We now looked at the sick cow. The young man opened her mouth, and upon looking in, the mucous membrane of the throat and nostrils was found to be much congested and somewhat inflamed, with but little drooling and slabbering. She did not get up.

We then went to see the cows in the pasture. This pasture bordered upon a swamp next to the river and was about twenty to thirty feet wide, and bounded on the other side by a deep swale or swamp, and over half a mile long. This strip of land was divided in the middle by an embankment or dike, which kept out the tide from the marsh land. Therefore there was left a strip of land about fifteen feet wide and a little over half a mile long that could be utilized for pasture. But no grass was to be seen save a few roots here and there, and these nearly covered by the droppings from the cows. They have no water to drink except that from the swamp, which was nearly as black as ink. These six cows were put out there after the others died, and were kept there night and day. They were placed there by order of the members of the Board of Health as above (the Feenfers called them the "cow-doctors"), and were quarantined there. They were fed with malt grains, and, as hereafter explained, drank the swamp water and breathed the swamp air.

On returning to the stable we found Mr. Michael Feenfer, the "farmer," had reached home. He was a very pleasant German and showed us the food which they called "malt grains and other stuff." There was a large hogshead standing under the before-described cow-shed, just in front of the door of the stable, which was about two-thirds full of malt grains and other materials, so sour and stinking that one could not look into it without getting sick. On asking the old man "If the cows liked that kind of food," he said: "Sometimes they acted as if they did not, and it made them cough sometimes." We inquired as to how much milk they got from the

cows, and he said "They got one hundred and twenty quarts from the thirteen, but now they got about sixty-five from the six." We asked how much do you get from the sick cow at a milking; he said, "About a pint, and that we give to the hogs."

How many hogs have you?—"We have but five now, two died last fall."

What was the matter with the hogs that died?—"They got sick like the cows, the five are pretty well now."

Now let us look at this matter clearly, in the light of reason and science, and what do we find? Brutes suffering; human ignorance; legalized cruelty to animals; woful want of intellectual investigation; wilful disregard of the very first principles of hygiene.

It hardly seems possible that any one with the slightest degree of intelligence could make any mistake as to where the primary cause of all this sickness was. Here was a depression, or hole made in the ground that caught all the surface drainage for, say two hundred feet around it. All the wash from the houses drained into it, all the filth from the stable and pig-pen drained into it, every rain washed through the hen-house into it. There was absolutely no exit for the water. The pool was dammed up, with all the excrement and vegetable matter that could be imagined, slowly putrefying and throwing off noxious gases. The cows were confined in stables which had no means of ventilation save one door and one window *opening out on this pool of filth.*

The food the cows ate came from the hogshead of malt grains and other garbage in a high state of fermentation. This "reeking mass of stuff" was given to support life and make milk, and the people buy and use this milk. The smell of this garbage at a distance of ten feet was enough to turn any stomach. This is a graphic but true pen picture of those cows' home life. Now the cows are sick. They must be taken out to pasture. These animals gain one thing by the change—sunlight. They must eat of the rank marsh grass, and drink of the fetid marsh water. I noticed fish in the sluices, but in this marsh water there are none. It's pretty bad water that cat-fish can't swim in.

Now taking the character of the cows' food, the air they

breathe, and the water they drink into consideration, is it any wonder that they should have diseases of the throat and lungs? It is a wonder that they have any healthy organs at all, and I doubt if they have. Mark the ignorant way in which the State Inspector does his work. Did he look for a cause upon the premises? No, he contented himself by asking the nearly as ignorant "farmer:"

Where did you get these cows?—"At the West Philadelphia Stock Yards."

And upon receiving the reply he caught at the pretext—Ah, that is it; you got one from the Stock Yards; yes, yes; she brought the infection with her.

Upon looking up the matter it is impossible to find that any of the stock at the Stock Yards were sick with this disease either before or after this cow was purchased. Now is it likely that the so-called infection was brought from the Stock Yard? Is it not a hundred times more likely that the bad air, bad water, and bad food at the farm induced this disease in the cows, the same as bad feed induced disease in the hogs last fall?

The gas that rises from decaying manure is exceedingly poisonous.

As in the case just mentioned, where there is a water-hole in the stable-yard which is not drained, it becomes the receptacle for the waste that is around the place. The drainage from the house, pig-pens, and stables drain into it. There is no outlet, and it must remain there only to find an exit in evaporation. The animal and vegetable matters settle down in it, fermentation begins and is hastened by the heat of the sun. Together with evaporation particles of organic matter in process of putrefaction are given off and noxious gases evolved. The gases thus evolved are sulphuretted hydrogen, sulphide of ammonium, carburetted hydrogen, nitrogen, and carbonic acid gas. It is said that air, otherwise pure, containing one part sulphuretted hydrogen in two hundred and fifty parts, will kill a horse. It is believed that the respiration of air containing one per cent. of this dangerous gas is quickly fatal to man.

It will be remembered that some years ago the crows became so numerous and annoying at the gardens of the Luxembourg, in Paris, that, in order to destroy them, a device was adopted of placing in the hands of the gardeners a small bag

containing sulphuretted hydrogen, to which was attached a tube that could be thrust into the foliage of the tree and into the midst of a flock of the crows without disturbing them. The gas was then allowed to escape, when the crows immediately fell to the ground, dead.

Now, Mr. Feenfer's cows were kept in a small shed and stable, where all the air they breathed must be mixed with those poisonous gases, and they were fed on the worst of garbage; and because their blood became poisoned the mucous membranes of the air-passages became congested. The cows are sick; the State Board of Health is notified of the fact, and the health officers, or, as Feenfer called them, "cow-doctors" are sent. They arrive, pronounce the disease *pleuro-pneumonia*, and condemn the sick cows to death; and those which are not sick they send to a swamp with filthy surroundings, there to be fed on putrefying garbage and filthy water, and compelled to breathe a foul atmosphere, and call this disposition of the cows "having them quarantined."

If asked whether there is any way of avoiding this condition of affairs, we would unhesitatingly point out the real reason for all the trouble, and at the same time suggest the cure. First comes fermentation and decomposition, the production of foul gases and of fungi in all their forms; of course this must be followed by disease.

Now, to my mind, nature intended that the ground should have air to breathe and water to drink, just the same as animals. It needs these, not so much for supplying nutriment to vegetation as it does to carry on the great work of assimilation and purification. Is it not a fact that all decomposition and filth is converted into innocuous material in nature's laboratory? And if so, is it not directly caused by fermentation and oxidation. It is burned and calcined into purity. The earth being loose and porous, the air and water force their way into it and supply the fuel to carry on the work of purification.

But let us suppose that the water is restrained by an impervious obstacle to its outward course: what happens? Simply this—it dams up slowly, inch by inch, forcing the air out of the soil as it rises. All motion and circulation is stopped, fermentation and decomposition soon begin, the earth is drowned out—suffocated—dead for want of air. How is this? Water

is good for the ground. Yes, but not in this way, the water must be moving constantly. There must be a *current* of both air and water if we would have a healthy soil.

This very much desired result can very readily be obtained by seeking a water gradient and proper drainage, so that water can follow and flow through the earth; so that God's most blessed earth's vivifiers—air, rain, and the dew—may *circulate* through it with their plenitude of oxygen going down into its pores, seeking out and burning all filth and corruption.

The above is a condensation of my investigations at Camden, N. J., a part of which has been published in some of the newspapers of Philadelphia and made the subject of considerable discussion.

C. R. EARLEY, M.D.

RIDGWAY, ELK CO., PA., September 14, 1885.

THE DISINFECTION OF CATTLE-TRUCKS.

M. REDARD, medical inspector of railways, in a communication to the Académie de Médecine on disinfecting cattle-trucks ('De la désinfection des wagons ayant servi au transport des animaux sur les voies ferrées'), states that epizootic diseases have greatly increased since the creation of railroads. Animals are conveyed from the seat of infection, and frequently when they are ill. Dr. Redard has made a careful inquiry into the subject, and has ascertained that epizootic diseases are often contracted by healthy animals in consequence of their being brought into contact with the virus of infection during transit. The present methods of disinfection are powerless to prevent propagation of epizootic diseases. Dr. Redard placed between the cracks of cattle-trucks portions of liver and kidneys reduced to pulp which he had removed from animals dead from charbon, septicæmia, and glanders, and also from fowls dead from fowl cholera; together with blood and the contents of the intestines. The trucks were afterward disinfected, and animals were inoculated with the virulent substance. One hundred such experiments were made. Ten animals inoculated with cholera virus died rapidly; the virus was not attenuated. Carbolic acid, chloride of zinc, and nitrosulphate

of zinc were used as disinfectants. Of ten animals inoculated with the charbon virus one died. Chloride of zinc, of two per cent. in strength, was used as a disinfectant. Ten inoculations with the virus of septicæmia, disinfected with carbolic acid two per cent. in strength, killed nine animals. Two inoculations with the virus of glanders, disinfected with carbolic acid and chloride of zinc, produced the characteristic lesions of glanders. The example of virus which was disinfected by carbolic acid was in contact with it during eight hours. All the animals inoculated with virus previously disinfected with sulphurous acid died rapidly; virus disinfected with steam at 100° was also fatal; superheated steam at 110° disinfected the virus submitted to its influence. An ass inoculated with glanders virus thus disinfected, during a space of two minutes, has not yet shown any symptoms of the disease. Two sheep were inoculated from murrain pustules and escaped the disease; the virus had been disinfected in one instance by steam heated up to 110° C., the other between 95° C. and 100° C. Seven animals inoculated with the virus of fowl cholera have not at present shown any morbid symptoms; the virus was disinfected with steam at 110°. Eight animals were inoculated with the virus of septicæmia; one died three days after inoculation. Dr. Redard and Dr. Miquel, of Montsouris, submitted Bacillus subtilis to steam heated to 110°, and observed that it was entirely destroyed. This bacillus is one of the most difficult to exterminate. Steam at 100° and chemical disinfectants are not sterilizing agents. In order to disinfect with vapor at 110°, Dr. Redard recommends the following method. A spiral tube is placed near the fire of a steam-engine, the steam passes through it, and its temperature is increased. The spiral iron tube is 21 millimetres in diameter and two millimetres thick. Its length, if straightened, would amount to 7 metres 300 millimetres. A surface of 400 square decimetres is exposed to the action of heat. The tube consists of seven spirals; each spiral has an external diameter of 18 centimetres; one of its extremities is connected with the tap of the boiler, and the other fits into a movable hinge, which, by the addition of a pipe, conveys the steam to the cattle-truck to be disinfected. This system, if carefully carried out, provides steam at 110° C.—*Sanitary Record.*

THE INJURIOUS EFFECTS OF OVERSHADING IN OUR HOUSES AND TOWNS.

By W. Thornton Parker, M.D., Newport, R. I.

In recent numbers of THE SANITARIAN have appeared some interesting and instructive articles concerning the preservation of our forests. This subject is one of national importance, and concerns not only the prosperity of the people in a pecuniary sense, but is of greater importance in relation to sanitary matters and the general protection of health. Concerning the preservation of our forests it would be difficult to write too much, and everywhere there is a sincere desire to preserve and protect them; and it is probable that some practical efforts in this direction will be made by the Government in the near future.

For many years our people have given considerable attention to this subject of forest culture, but instead of exercising their influence in the direction of forest culture and protection where it is most needed, many seem to content themselves with planting as many trees as possible in our parks and streets and on their private grounds in our cities and towns. This love for the beauty of foliage has often been too extravagantly bestowed, and the societies formed for the planting are not always under the direction of the wisest, and the planting, from a sanitary point of view, has not yet received much attention. To plant as many trees as possible seems to be the only rule, and this is limited only by the means of the planter and the amount of land at his disposal. This natural love for the beauty of foliage, and the abhorrence so many feel at the sight of falling trees, have been often recited in the old poem of "Woodman, spare that Tree." So much has this affection been misdirected, that many sicken and die from too much foliage in our towns and villages, even as many must also suffer from the wanton destruction of our forests outside. This condition of overshading is very noticeable in our New England and Middle States towns; indeed, it is to be found everywhere in our

land. In New Mexico, Colorado, and Kansas, where trees grow only after considerable attention from those who would have them, and where often considerable expense and time and labor must be given to rear them, one finds the houses often seriously overshaded. The climate is health-giving and nature affords everything desirable, and the atmosphere is pure and strengthening, but man, dissatisfied and complaining, at once attempts to hide his home by the densest shade possible, thereby cutting off the supply of pure air and hiding his home and his family from the life-giving sunshine. The earth which he found healthful he loads with impurities, and, having prevented any chance for these impurities to become disinfected by pure air and sunlight, soon berates the new climate for the inevitable sickness and even death which must soon follow. To those of us who are used to the scorching sun of our western deserts, a healthful, pleasant shade is a pleasure worth having; but rather the scorching prairie sun than the damp, dead atmosphere to be found in so many of our Eastern yards. The white faces and sickly appearance of so many of our people—men, women, and children—suggest that medical men should call attention to the growing evil of overshading our streets and yards and houses. True it is that our summers are hot, and to be "beneath some grateful shade" is often very desirable and pleasant; but the evil results of this overshading do not seem to be sufficiently appreciated.

Where the grounds about our country houses are extensive, the luxury of shade trees can be indulged in; but healthy shade without perfect ventilation and circulation of air is impossible. The soil to be fit for man to live upon must have the rays of the sun to bathe it, and the fresh warm air to come in contact with it. A soil damp and overshaded to such an extent that the sun never reaches it, is unfit for a play-ground for our children or a retreat for adults; indeed, such a place is a veritable death-trap for many infants and weakly persons, both in summer and in winter.

Houses overshaded are not healthful, and too many trees near sleeping and living rooms exercise a very injurious influence. It would seem as if these truths must be too well known to need any statement, but a journey through many of our towns the past summer and careful investigation have con-

vinced me that this undesirable condition of things is only too common, and has become a positive injury in almost every direction. The bad results are, in point of fact, much more serious than most people seem to be aware of. A soil loaded with roots and densely shaded is unfit for man to live upon constantly, and is certainly no place for a permanent house. The air entering the bedrooms and living-rooms from such surroundings is chilly and dead, and is not at all nutritious as it should be. Such an atmosphere cannot bring health, but is, on the contrary, very apt to be productive of sickness and even death, especially among children and invalids. The axe would be a rich blessing if freely used about countless thousands of our overshaded homes; and it would be well for our people if medical men would bear this in mind, and govern themselves accordingly; frankly stating to their patients, in assuming the professional care of the sick, that improvement could not be expected to take place until some of the superfluous limbs and trunks had been removed. Trees preventing the incoming of God's sunshine into our homes should be speedily cut down and carried away, and then the soil would be allowed some chance to dry, or rather, one might truly say, "to breathe!" The earth, to be healthy, needs, just as our bodies need, contact with the warm dry air and the life-giving rays of the sun. As man pales, sickens, and dies without the blessing of the sunshine, so, too, the earth dies and becomes unfit for even the feet of man. The importance of healthy soil about our homes must be more carefully considered in studying the laws of health. The houses which are overshaded contain dead, poisonous air, and cease to be fit for human habitation. It frequently happens that physicians are called to prescribe for ailing people who seem to possess every comfort and luxury, and who are really failing only because their houses and grounds are *overshaded.* This evil cannot be overestimated, and it is certainly serious enough to arouse the attention of the medical profession to contend against it. We can easily see, then, that the beauties of the foliage which are so justly admired are often attained at great loss of health and even of life itself; and undoubtedly consumption, that most dreaded disease of these latitudes, is caused in countless instances by overshading our streets and house yards.

THE SANITARIAN, in pursuing its mission of protection for the public health, will bear this warning against overshading our homes, although it will always encourage every effort to preserve and enlarge our forests.

OVER-PRESSURE IN SCHOOLS AND HOME LESSONS.*

By Dr. MARTIN, OF BOLTON, ENGLAND.

OVER-PRESSURE injures the health of children, produces misery at home, both for parents and children, almost every night. Children, in order to keep pace with the present code, have to pore over their lessons (in some instances) until ten, eleven, or twelve o'clock at night (as do pupil teachers, who should be growing in body and mind). Next morning the child goes to school without being able to eat its breakfast; the effect of this upon the brain and nervous system takes away the appetite, enervates the child, and stunts its growth; then follow headaches, vomiting, nervous debility, brain fever, talking and walking about in the bed-room in the night, St. Vitus' dance, curvature of the spine, heart disease, myopia, spitting of blood, and in some instances convulsions and death. I have personally seen all the above in my own district. The dread of the examination, of the inspector's visit, the anxiety to gain a prize, or the thought of not being able to pass the examination, so as to leave school in order to work for a livelihood, have each and every of them a share in the production of mischief. The master or matron is worried and in misery about the grant, the inspection, the school pence, and the managers; and to aid in increasing the number of passes and the augmentation of the grant, the managers or teachers in some instances send for all children (even from houses where there exists infectious or contagious disease) to be present at the examination, no provision being made in the Education Act for the counting of those as present at the examination who have been kept from school for the protection of the public health. In reference to schools, light, position, ventilation, and proper warmth are all essential

* Abstract of report of proceedings of British Medical Association, Public Health Section, July 30, 1885, from New York *Medical Record*, August 29, 1885.

to the health of children and teachers. I now repeat what I stated on May 4, 1883, viz.: "It is very important that children who have a capacity for education in the higher branches of knowledge should have every opportunity of gaining such knowledge, and that the State should assist. It is also very necessary that a child or young person be at school five or six hours a day, but I often see children whose health is injured by over-study or brain work; such children might very properly be excused what teachers call home work, to enable them to learn domestic duties, and assist their parents or guardians. At the same time it would make them more healthy and more fitted to the wants of the country."

Since I read my paper at Liverpool in 1883, home lessons have ceased at some schools for very young children, and parents now know that home lessons cannot be insisted upon and are illegal. The examinations have been less rigid; but still the code is too high, and as it is monstrous to imagine that all children can be brought up to the same level, the boasted one hundred per cent. of passes is a very strange thing. The head master or mistress of every school ought to have the option of removing from examination, at least seven per cent. of those who can give their whole time to school, and fifteen per cent. of "half timers," who have not the same privileges as others; this, with an allowance for children kept from school for the protection of the public health, would mitigate to some extent the evils existing. The special committee of the London School Board admit that they have not had the advantage of practical medical testimony when speaking of increased physical benefit. But it has been stated that "throughout the country the voices of managers, teachers, and employers of labor bear witness to the diminished vigor and attenuated limbs of the children of our working population, and ask if there is no way of opening the eyes of our education theorists to the bitter and terrible wrongs inflicted on our young." Professor T. Pridgen Teale, a very high authority, says he is "simply horrified at the refinement of human slavery and torture invented and carried on in this civilized country." The question of ill-fed children is a very important one, but of all the cases that have come under my care, only two could be said to be due to improper feeding, and not one to want of sufficient food; the punishment must be

severe where a child is crammed in the head, and nothing in the stomach. Teachers also come in for a full share of torture. Three teachers have died in the Bolton District within a very short time, all comparatively young; one of them died on the very day of the examination of his school. It is a well-known fact that myopia is unknown among the wild tribes. Some time ago, at Berne, Professor Pflüger, a great authority, gave it as a fact that more than one-half of forty-five thousand children examined in Germany, suffered from defective vision; in some schools those suffering from myopia, or shortsightedness, amounted to seventy or eighty per cent., and the commission actually found twenty per cent. of the boys, and from thirty to forty per cent. of the girls, suffering from curvature of the spine. The most enthusiastic devotee of excessive education would regret to see the above state of things take the place of the indomitable pluck, energy, and endurance of our forefathers.

DR. SWETE, of Worcester, said that there could be no doubt that over-pressure in schools was due to the way in which par ents were pushing on their children to get on in the world, and, as an inspector said in his district, the children had too much brain food and too little stomach food. In Scotland, where children studied well, they were fed on oatmeal porridge and milk, but in English towns the children got scarcely any phosphates and too much brain work for their stamina.

DR. DRYSDALE, of London, said it was an axiom in his mind that children could not be better educated than they were fed. The chief point in education was first of all to give good nutrition, and he was convinced that the State system of education, as at present in vogue, would break down, unless the supply of children were greatly reduced, so that the number to be educated did not exceed the capacities of the capital of the country to feed, clothe, and house adequately. It would be possible for the State to insure comfort and education to all born into it, but if it did this it was bound, as J. S. Mill said to us, to see that no one was born without its consent.

SURGEON-MAJOR PRINGLE said he was much struck on returning to this country after an absence of twelve years, to find so many boys and girls wearing spectacles, and suspected this must be caused by the over-pressure in Board schools.

REQUIREMENTS OF THE MODEL SCHOOL-ROOM.

(1) SHAPE. It should be oblong, the width being to the length about as three to four, with the teacher's platform at one end.

(2) Size. For primary or grammar school, with register of 54 pupils and attendance of about 50, the room should be about 33 feet long, 25 wide, and 13 high, which gives practically upward of 200 cubic feet and 16⅔ square feet of floor space to each pupil.

(3) Lighting. Four windows on the left of the pupils as they sit, the tops being square and not more than six inches from the ceiling, the bottoms being at least three and a half feet from the flour, equally spaced, not grouped, with transom sashes hung at the base above the sliding sashes. A window or two in addition at the back is admissible. The size of the windows on the side, taken collectively, should equal at least one-sixth of the floor space. The highest authorities in school hygiene require 300 or 350 square inches of glass for each pupil.

(4) On the side opposite the windows, two doors, with transom windows above, hung at the base; and between these transom windows, and on the same line, two more windows of the same kind and hung in the same manner.

(5) The wall should be slightly tinted, but not the ceiling.

(6) A black-board may be between the doors, but a sliding black-board back of the teacher's platform, or a portable one on the platform, in accordance with the German idea, would perhaps be better than the profusion of wall black-board now in vogue among us.

(7) Location of seats. The main rule to be observed in the placing of the seats is to carry them as far as possible toward the window side of the room, and as far as possible from the opposite side; the aim being to make the arrangement such that the distance of the outer row of desks from the windows shall not exceed once and a half the height of the top window from the floor.

(8) Clothes-rooms. There are three kinds of depositories for the pupils' clothes, all of which are more or less in vogue, namely: (1) one room for the whole school or several classes; (2) a room attached to each school-room; (3) arrangements within each school-room, either wardrobes, or racks or pegs on the wall. The second kind is most prevalent, and is thought by some to be indispensable; it has important advantages, but its use by both sexes is objectionable; it is difficult for the teacher to maintain supervision over it. It is an important item in the cost of building, and proper provision for it is a difficult obstacle to overcome in planning large buildings: hence, in some cases, as in that of the London school, the large common room is preferable; and provision within the room, as above mentioned, is perhaps to be preferred to the small clothes-room, where the number of scholars accommodated in a room is not large. In the Boston school, above described, the third kind is provided, as is the case in the Vienna and other first-class European schools.—*City School Systems in the United States.*

STEAM-PIPE DANGERS.

SOME weeks ago while enjoying an agreeable call on Dr. Eugene Grissom, the accomplished Superintendent of the Asylum for the Insane at Raleigh, N. C., he submitted a conundrum to us to account for a fire that had recently occurred in a clothes-drying closet of that institution, wholly heated by steam-pipes. This we readily solved from our knowlege of similar incidents, in complete accord with the following excerpt from the *Insurance Monitor* for September. In the course of a recent lecture by Dr. Tanner before the Louisville Board of Underwriters this subject was discussed at considerable length. In the course of his address, Dr. Tanner spoke as follows:

Mr. James Braidwood, who was for many years chief of the London Fire Brigade, made the startling statement in 1846, that it was his belief that "by long exposure to heat not exceeding 212° degrees timber is brought into such a condition that it will fire without the application of light. The time during which this process will go on until it ends in spontaneous combustion is from eight to ten years, so that a fire might

be hatching in a man's premises during the whole time of his lease without making any sign." Among the many instances cited by Mr. Braidwood in support of this statement is one to the effect that a fire in the Bank of England was traced to a stove which was resting on a cast-iron plate one inch thick, this in turn resting on concrete two and a half inches thick, which was supported by wooden joists, the joists under the stove igniting. If this is a cause of fire, then the majority of houses heated by means of steam, hot water, and hot air are in constant danger of fire from spontaneous combustion, since the general impression prevails that the pipes and flues for heating can with impunity be placed in contact with timber. In examining this cause of fires, the first question is whether wood will char at as low a temperature as 212°. In tearing down houses for the purpose of rebuilding, the timber in contact with the heating pipes and flues has often been found charred. Charcoal is made for certain purposes in the arts at 300°. As the result of experiments performed by myself in the laboratory, small pieces of white pine heated a few hours in an air bath at a temperature of 300° were partially converted into charcoal. Considering these facts, it must be admitted the temperature of 212° is sufficient if applied for a long time to convert wood into a partially burned charcoal. Accepting this as a fact, the next point to consider is the degree of heat at which charcoal will ignite. Made from the same wood at different temperatures, the products ignite accordingly; that is, if made at a low heat it fires from a correspondingly low temperature. It has been determined experimentally that charcoal for making powder, when made at 500°, would fire spontaneously at 680°, and when wood has been carbonized at 260°, a temperature of 340° only was required for spontaneous ignition. Under certain circumstances, charcoal made at a temperature of 500° even will ignite when heated to 212°.

So far the discussion of heating-pipes and flues as a cause of spontaneous fires has been upon the false idea that they are never heated beyond 212°. Under the ordinary pressure of the atmosphere, as when water is heated in the open air, it boils at 212°, but if it is heated under pressure, the boiling temperature increases accordingly; for instance, water boiling at a temperature of 212° is under a pressure of one hundred and

forty-seven pounds, equal to a column of water one inch square and about thirty feet high; if the pressure is increased to two atmospheres, the temperature required will increase to 249°, and so on, so that when a steam-gauge registers sixty the actual pressure is seventy-five pounds, and the temperature at which the water is boiling as high as 307°. The higher the house the greater must be the pressure, and hence the higher the temperature at which the water boils, and it follows that the pipes must heat accordingly, and it is stated that in some systems of hot-water heating the pipes have the water started through them at a temperature of 350°. Then, where furnaces are used for heating, the temperature in a flue has been found to be 300°, at a distance of fifty feet from the fire. Couple these figures with those given in reference to the heat necessary to produce charcoal and cause its ignition, and it must be admitted that these pipes and flues for heating are responsible for many fires. The application of these facts is as follows: After long exposure, the wood in contact with the heating pipes and flues is changed on the surface to charcoal. During the warm season this charred surface absorbs moisture from the air, then in the fall comes a cold spell and heat is turned on, when the moisture is driven from the pores of the charcoal, leaving it in a condition to readily absorb gases. The cold abates and the heat is lowered; fresh air in abundance then passes into the confined spaces where the pipes are generally placed, rapid absorption of oxygen from the air by the charcoal follows, with heating and spontaneous firing as already explained. The body of the timber is heated, and this heat prevents too rapid cooling of the charred surface when the fresh air passes in, otherwise the charcoal would be placed under circumstances unfavorable to ignition. The experiment of burning iron filings in the flame of a spirit-lamp illustrates the influence of division upon the igniting point; now if the iron is in a pulverulent state, as when made by hydrogen, it will, when freshly made, ignite to a red heat when shaken into the air. Then, if it is true, as stated by an English scientist, that the oxide of iron, if placed in contact with timber and excluded from the air, and aided by a slightly increased temperature, will part with its oxygen and be converted into very finely divided particles of metallic iron, here is another cause of fires from heating-pipes.

For during the summer the pipes rust, and then when heated the rust is reduced, leaving the metallic iron in the same condition as that made by hydrogen; the temperature is lowered, fresh air appears, and oxygen is rapidly taken up by the finely divided iron, each particle heating so rapidly as to give a red heat to the mass. I have not been able to prove this experimentally, but as carbon is able to overcome quite strong chemical affinities, and will reduce the oxide under strong heat, theoretically it is possible, and the authorities all tend to prove it. Considering all the points bearing upon hot water and steam-pipes, also heating-flues, an explanation is found of the great number of fires occurring at the approach of winter, and which are reported as from defective flues, supposed incendiary origin, or causes unknown. Steam-pipes packed in sawdust or shavings to retain the heat while steam is conveyed to a distance have given fires. One peculiar and important instance is on record of a fire from steam-pipes. In the drying-room of a woollen mill a pine board was placed some three or four inches above the steam-pipes to prevent wool from falling upon them. A fire followed, and after being put out, a careful examination determined to the satisfaction of all, that the heat of the pipes had distilled the pitch from several knots in the pine board, and this dropping on the pipes had ignited and caused the fire. The illustration needs no comment, as the lesson is too plain to need pointing out.

PHILOSOPHY OF LONGEVITY.

THERE is much in modern life that tends to shorten existence and to diminish the probability that a man or woman will reach ninety, to say nothing of a hundred. We lead more exciting and more wearing lives. It is in vain that a person has a splendid constitution to begin with, wears flannel, or the equivalent of flannel, next to his skin, dwells in a warm, dry house, and eats and drinks everything that is good and wholesome, if at the same time he habitually overtaxes his strength, looks upon his muscles as mere machinery to be driven at high pressure, and ruthlessly calls upon his nerves to squander their reserve

power when every other source of energy is exhausted. Men or women who intend to be centenarians in these days must combine something of the old mode of life with something of the new mode of living. They must, while availing themselves of all the scientific discoveries and sanitary appliances of the age, imitate their grandsires in the steady and tranquil habits that prevailed before the invention of locomotives and the telegraph. They must have their eight hours of sleep regularly; they must have intervals of repose and vacancy in the daytime; they must spend a goodly portion of their waking hours in the open air. Nor will that suffice; there will have to be regularity in the hours of their meals, and discipline in the ordering of the dishes of which the meals are composed. We cannot believe that anybody will ever live to one hundred who eats a heavy dinner every night of his life at eight o'clock. Champagne in abundance, and Bordeaux or Burgundy *ad libitum*, are very delightful things, but they are to be forsworn by persons who deliberately set before them the attaining of their hundredth birthday. Neither, with such an end in view, would the active life of a politician, a lawyer, or a doctor be a sane enterprise. In order to reach that distant goal there must be a training, if not severe, at least regular and unflinching. Most of all, there must prevail in the existence of such a person a tranquil serenity, an unruffled calm. Neither generous passions nor enthusiastic ideals must be allowed admittance. The pulse must never be driven up beyond a certain point, either by work, by anxiety, by fear, or by hope. At the same time, mere stagnation will, in all probability, never enable a person to live to one hundred. There is such a thing as rusting out as well as wearing out. If a candle does not burn brightly enough, it does not consume the wax with sufficient rapidity, and goes out for want of adequate combustion. It is so, no doubt, with the human body and the human spirit. . . .

To make yourself miserable at forty in the wretched ambition to add a few worthless years to your score after you have turned seventy or eighty is surely a poor-spirited sort of game. To spend one's life feeling one's pulse, looking at one's tongue, and asking one's self if one is treating one's constitution quite fairly, is not life at all. It is to live in a hospital, or, at any

rate, an infirmary. Still, there are some persons who are congenitally cautious, congenitally cold, congenitally calm. It is their nature to take things quietly, never to be in a hurry, never to excite themselves. They are content to sit in an easy-chair for so many hours, read an agreeable book for so many hours, drive in a carriage for so many hours when the weather is favorable for so many hours, and to regulate their existence by clockwork. They may live to one hundred, they may live to one thousand, but in truth they have not lived at all. The man who really gets the best that can be got of life is the man who, with a fairly good constitution to begin with, is ready to squander it at any moment and on every occasion in a sufficient cause. He keeps no account of profit and loss with his vital energy; he sees work to do, and he does it; he sees pleasure to be enjoyed, and he enjoys it. He is alive all his life save when he sleeps, and he awakes from each fresh slumber looking the world cheerfully and courageously in the face, and ready, and even eager, to be a combatant when there is a good, honest fight, and a runner when there is a good, honorable race afoot. He may not live to be one hundred, but he may well live to be seventy, seventy-five, or even eighty. He may have a career, if not so conspicuous, yet as active, as varied, and as restless as that, say, of Mr. Gladstone, and yet not be really old when time registers him among the aged. "Better fifty years of Europe than a cycle of Cathay;" and better twenty years of uncalculated activity than the slow pulse and measured step of the circumspect snail that creeps surely on to one hundred. We are not denouncing centenarians. They are like angels' visits, few and far between, and they are too rare not to be welcomed. Moreover, we doubt not that they deserve their length of years. But it would be a misfortune if it was ever thought an object of life to live very long. The object of life is to live, live generously, live bravely. As Shakspeare says, "Ripeness is all."—*London Standard.*

THE SOLUBLE HYPODERMIC TABLETS, prepared by Messrs. Caswell, Hazard & Co., are of very great convenience to medical practitioners, and like all the preparations of that celebrated house perfectly reliable.

THE PROGRESS OF STATE MEDICINE IN NEW YORK.

AN ACT FOR THE PRESERVATION OF THE PUBLIC HEALTH, AND THE REGISTRATION OF VITAL STATISTICS.

[Chapter 270. Passed May 12, 1885; three-fifths being present.]

SECTION 1. It shall be the duty of the common council, upon the nomination of the mayor of every city in this State, except in the cities of New York, Buffalo, Albany, and Yonkers and Brooklyn, which are hereby excepted from the operation of this act, to appoint a board of health for such city, to consist of six persons who are not members of said council (one of whom, at least, shall be a competent physician), who shall be nominated and appointed as follows: Two persons for a term of one year; two persons for a term of two years; and two persons for a term of three years. The mayor of such city shall be a member *ex officio* of such board of health, and shall be president thereof. The said board of health, when duly organized, shall appoint a competent physician (not a member of such board, who shall be health officer for such city. Upon the expiration of the term of office of any member of the board of health, appointed as herein provided, his successor shall be nominated and appointed in like manner for the term of three years; and the said mayor and common council shall also have power to fill any vacancy caused in such board of health by the death, resignation, or removal from the city of any member thereof. And it shall be the duty of the trustees of every incorporated village in this State to appoint, once in each year, a board of health of such village, to consist of not less than three nor more than seven persons (who are not village trustees), who shall hold office for one year, or until their successors shall have been appointed. The said board of health thus constituted shall elect a president, and appoint a competent physician (not a member of such board) to be the health officer of such village. This section shall not be construed to remove any of the existing boards of health

in any of the cities or villages of this State, but the successors of such boards shall be appointed as in this section provided.

§ 2. It shall be the duty of the supervisor, the justices of the peace, and the town clerk in each town in this State to meet in their respective towns within thirty days from the date of the town election in each year and elect a citizen of such town of full age, who with them shall constitute the board of health for such town for one year or until their successors are chosen. The said board of health shall appoint some competent physician, not a member of said board, to be the health officer for such town. If in any case a vacancy shall occur in the board of health of any city, village, or town, by the death, resignation, inability to act, or removal from said city, village, or town of any member thereof, and if the proper authorities, by inability, neglect, or refusal, fail to fill such vacancy, it shall be the duty of the county judge of the county in which such city, village, or town is situated, upon being satisfied that such vacancy should be filled without delay, to appoint in writing a competent person to fill such vacancy for the unexpired term. The written appointment to a board of health made by a county judge under this section shall forthwith be filed in the office of the clerk of the county in which said board of health is located. Notice of the membership and organization of all boards of health in this State and of all changes that may from time to time occur therein shall be given forthwith to the State board of health.

§ 3. The several boards of health now organized in any city, village, or town in this State (except in the cities of New York, Brooklyn, and Buffalo), and the several boards of health constituted under this act, shall have power, and it shall be their duty:

1. To meet at stated intervals in their respective cities, villages, and towns; also, whenever the State board of health, or the president and secretary thereof, shall, by notice to the presiding officer of any city, village, or town board of health, request him to convene such board to take certain definite proceedings upon matters concerning which the said State board of health, or its president and secretary, shall be satisfied that the action recommended by them is necessary for the public good, and is within the jurisdiction of such board of

health. Any wilful violation of any lawful instruction of said State board of health shall be a misdemeanor.

2. To prescribe the powers and duties of the local health officer, who shall act as executive officer of the board; to direct him from time to time in the performance of his duties, and to fix the compensation he shall receive.

3. To guard against the introduction of contagious and infectious disease, by the exercise of proper and vigilant medical inspection and control of all persons and things arriving in such city, village, or town from infected places, or which, for any cause, are liable to communicate contagion; to require the isolation of all persons and things infected with or exposed to contagious or infectious diseases, and to provide suitable places for the reception of the same; and, if necessary, to furnish medical treatment and care for sick persons who cannot otherwise be provided for; to prohibit and prevent all intercourse and communication with or use of infected premises, places, and things; and to require, and, if necessary, to provide the means for, the thorough purification and cleansing of the same before general intercourse therewith, or use thereof, shall be allowed. And it shall be the duty of every such board of health to report to the State board of health promptly facts which relate to infectious and epidemic diseases, and every case of small-pox or varioloid occurring within its jurisdiction; and to provide at stated intervals a suitable supply of vaccine virus of a quality or from a source approved by the State board of health; and during the existence of an actual epidemic of small-pox, said local board of health shall obtain fresh supplies of said virus at intervals not exceeding one week, and shall at all times provide thorough and safe vaccination for all persons within its jurisdiction who may need the same.

4. To receive and examine into the nature of complaints made by any of the inhabitants concerning nuisances, or causes of danger or injury to life and health within the limits of its jurisdiction; to enter upon or within any place or premises where nuisances or conditions dangerous to life and health are known or believed to exist, and by appointed members or persons to inspect and examine the same; and all owners, agents, and occupants shall permit such sanitary examinations;

and said board of health shall furnish said owners, agents, and occupants a written statement of results or conclusions of such examinations; and every such board of health shall have power, and it shall be its duty, to order the suppression and removal of nuisances and conditions detrimental to life and health found to exist within the limits of its jurisdiction.

5. To supervise and make complete the registration of all births, marriages, and deaths occurring within the limits of its jurisdiction in accordance with the methods of forms prescribed by the State board of health, and to secure the prompt forwarding of the certificates of birth, marriage, and death to the State Bureau of Vital Statistics after local registration; and in so completing the said registration the cost thereof shall be a charge upon such city, village, or town, and shall not exceed fifty cents for each completely verified and registered record of birth, marriage, or death. And to secure the completeness of the said registration it shall be the duty of the parents or custodian of every child, and the groom at every marriage, or the clergyman or magistrate performing the ceremony, to secure the return of the record of such birth or marriage to the board of health, or person designated by them, within thirty days from the date of such birth or marriage, and each record shall be duly attested by the physician or midwife (if any) in attendance at such birth, or the clergyman or magistrate officiating at such marriage. And it shall be the duty of the health officer of every such board of health to receive and examine and secure the registration of all certificates and records of death and causes of death and findings of coroners' juries, and said board of health shall designate the persons who shall grant burial permits for the burial of the dead, and transit permits for the transportation of the dead bodies of persons which are to be carried for burial beyond the limits of the county where the death occurs; and it shall be the duty of the undertaker, sexton, or other person having charge of the body of any dead person to procure a record of the death and its probable cause duly certified by the physician in attendance on the deceased during his last illness, or by the coroner where an inquest is required by law; and there shall be no burial nor removal of the body of any dead person until said duly certified record shall have been presented to the

board of health or person designated by them, and until thereupon a permit for burial or transit shall have been obtained. And the said board of health shall prescribe sanitary regulations for such burials and removals of the dead. It shall also be the duty of every such board of health to provide for obtaining copies of the said registered records of births, marriages, and deaths, and for the amount and payment of fees for such copies. Such copies, duly attested by the local registering officer, and verified transcripts from the records preserved in the State Bureau of Vital Statistics shall be admitted in all the courts of this State as *prima facie* evidence of the facts therein set forth. If in any place in this State the State board of health ascertains that the said registration of births, marriages, and deaths is not completely and well made, said State board shall notify the local board of health in such place that, within one month from the date of such notice, said defects and neglect in the records must be amended and prevented. If at the expiration of the time mentioned the said defects and neglect are not overcome and prevented by the said local authorities, it shall be the duty of the said State board of health to take control of the said records, and enforce the rules and regulations with reference thereto, and secure their completeness and proper registration within the limit of cost hereinbefore specified, and to continue such control until the said local board of health shall satisfy the said State board of health that they will actually make the said records and registry complete as required by law. Any person neglecting or refusing to make out or file for registration any record as aforesaid, and any person causing, permitting, or assisting in the burial or removal of any dead body, unaccompanied by a permit for such burial or removal, duly issued by the local board of health having jurisdiction where the death occurred, and any officer or board that shall neglect or refuse to register and preserve the said records and forward the certificates to the State Bureau of Vital Statistics as above required, shall be deemed guilty of a misdemeanor and may be prosecuted in any court of competent jurisdiction.

6. To make, and from time to time to publish, in such manner as to secure early and full publicity thereto, all such orders and regulations as they shall think necessary and proper for

the preservation of life and health and the successful operation of this law; and to make, without publication thereof, such orders and regulations in special or individual cases, not of general application, as they may see fit concerning the suppression and removal of nuisances, and concerning all other matters in their judgment detrimental to public health, and to serve copies thereof upon any occupant or occupants and the owner or owners of any premises whereon any such nuisances or other matters aforesaid shall exist, or to post the same in some conspicuous place on such premises.

7. To issue warrants to any constable or police of their respective cities, villages, and towns, to apprehend and remove such persons as cannot otherwise be subjected to the orders and regulations by them adopted; and whenever it shall be necessary to do so, to issue their warrant to the sheriff of their respective counties to bring to their aid the power of the county; all which warrants shall be forthwith executed by the officers to whom they shall be directed, who shall possess the like powers, and be subject to the like duties in the execution thereof, as if the same had been duly issued out of any court of record in this State.

8. To employ all such persons as shall be necessary to enable them to carry into effect the orders and regulations they shall have adopted and the powers vested in them by this act, and to fix their compensation.

9. To impose penalties for the violation of, or non-compliance with, their orders and regulations, and to maintain actions in any court of competent jurisdiction to collect such penalties, not exceeding one hundred dollars in any one case, or to restrain by injunctions such violations, or otherwise to enforce such orders and regulations.

§ 4. Every person who shall wilfully violate or refuse to obey any order or regulation made and published by the board of health of any city, village, or town in this State, or any order made and served, or posted as aforesaid, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be subject to fine or imprisonment, or both, in the discretion of the court, such fine not to exceed one thousand dollars nor such imprisonment six months. And in any case of non-compliance with any order or regulation which shall have been

served or posted, as provided in subdivision six of section three of this act, the said board or its servants or employees may lawfully enter upon any premises to which such order or regulation relates, and suppress or remove the nuisance or other matters in the judgment of said board detrimental to the public health mentioned in such order or regulation, and any other nuisance or matter of the description aforesaid found there existing; and the expense thereof shall be a charge upon the occupant or any or all of the occupants of said premises, or upon the person or persons who have caused or maintained the nuisance or other matter of the description aforesaid, and may be sued for and recovered with costs by said board in the name of such board in any court having jurisdiction. Whenever execution upon any judgment so obtained shall have been returned wholly or in part unsatisfied, said judgment, for the amount so unsatisfied, shall be a lien upon said premises, having preference over all other liens or incumbrances whatsoever. But in order to acquire such lien, such judgment, if in a court not of record, shall first have been docketed in the same place and manner as by law now required to make judgments in such courts liens upon real estate. And whenever any lien upon any premises shall have become fixed as aforesaid, the said board may cause the said premises to be sold at public auction, for a term of time, for the payment and satisfaction of such lien, and the expenses of such sale, giving notice of such sale for twelve weeks successively, once in each week, in one or more newspapers published in the city, incorporated village or town where the premises are situated, as the case may be; or if no newspaper be published in such village or town, then in the newspaper published nearest said premises, and also serving a copy of such notice of sale personally on the owner or agent of said premises, if known, and a resident of said city, village or town, at least fourteen days previous to such sale, or by depositing the same in the post-office, directed to such owner or agent at his place of residence if known, or the nearest post-office thereto, at least twenty-eight days previous to such sale. And the said premises shall be sold to the person who shall offer to take the same for the shortest time, paying the amount remaining unpaid upon such judgment, with interest, and the expenses of such notice and sale. A certificate of

such sale, signed by the president and countersigned by the secretary of such board, shall thereupon be made and delivered to the purchaser, and may be recorded in like manner and with like effect as deeds of conveyance of lands, and thereupon the purchaser, his heirs or assigns, shall be entitled to the possession of said premises so sold as aforesaid, and if unoccupied may immediately enter, and if occupied may have remedy against any occupant by action or by summary proceedings as against a tenant holding over after expiration of his term; and in case the costs of such action or proceeding shall not be collected by such purchaser of the defendant therein, the same shall be a lien upon said premises, having the like preference as the lien aforesaid, and the term of the said purchaser shall be extended during a time bearing the same proportion to the original term as the amount of such cost bears to the amount paid by such purchaser on such sale. And such term shall commence when such purchaser shall have acquired possession. At any time after such sale and within six months after the recording of such certificate as aforesaid, the owner or any lienor or incumbrancer of such premises, or of any part thereof, may redeem by paying to the purchaser the amount paid by him on such sale, and all costs and expenses he may have incurred in any action or proceeding as aforesaid, to obtain possession, with ten per cent. interest thereon. If such redemption be made by the owner, the right of the purchaser shall be extinguished; and if by such lienor or incumbrancer, the amount paid by him to redeem shall be added to his lien or incumbrance, or if he have more than one, to the oldest, and shall thenceforth partake of the nature thereof and be collectible by any remedy adapted thereto.

§ 5. All expenses incurred by the several boards of health in the execution and performance of the duties imposed by this act shall be a charge only on their respective cities, villages and towns; and shall be audited, levied, collected and paid in the same manner as other city, village and town charges are audited, levied, collected and paid.

§ 6. Whenever any pestilential, or infectious or contagious disease shall exist in any county poor-house in this State, or in the vicinity of any such county poor-house, and the physician of such county poor-house shall certify that such pestilence or

disease is likely to endanger the health of the persons supported at such poor-house, the superintendent of such county poor-house shall have power to cause the persons supported at such poor-house, or any of them, to be removed to such other suitable place in the same county as shall be designated by the Board of Health of the city, town or village within which such poor-house shall be situated, there to be maintained and provided for at the expense of the county, with all necessary medical care and attendance, until they shall be safely returned to the county poor-house from which they were taken, or otherwise discharged.

§ 7. Any legally organized Board of Health in an incorporated village, which comprises parts of several towns, or less than a whole town, shall have full authority in regard to all matters relating to public health within said village, and such village shall not be subject to the sanitary regulations or health officers of the township or towns within which such village is located; nor shall the taxable property of any such village, while maintaining its own Board of Health, be subject to taxation for maintaining any town Board or Boards of Health, or for any expenditures authorized by such town boards; but such expenditures of the town Boards of Health shall be assessed and collected exclusively on property in the town outside of said village. But nothing in this act shall be construed to prevent the boards of health of two or more towns adjacent to each other or of towns and villages therein situated from uniting in a combined sanitary and registration district by the appointment of one health officer and registering officer for such district, whose authority in all matters of general application shall be derived from the several Boards of Health having jurisdiction within such district; and in special cases, not of general application, arising within the jurisdiction of any such Board of Health the said officers shall derive their authority from such board alone. Such combined districts shall be formed subject to the approval of the State Board of Health.

§ 8. Any duty prescribed or enjoined by this act upon any local Board of Health, or any member or officer thereof, or upon the common council of any city or any member thereof, or upon the board of trustees of any village or any member thereof, or upon any officer of any city, village or town may

be enforced by a mandamus at the instance of the State Board of Health, its president, secretary or any member thereof.

§ 9. Chapter one hundred and fifty-two of the laws of eighteen hundred and forty-seven, chapter three hundred and twenty-four of the laws of eighteen hundred and fifty and the several acts amendatory thereof, chapter five hundred and twelve of the laws of eighteen hundred and eighty, except subdivision thirty-four of section one of said act, and all other acts or parts of acts, general or special, inconsistent with the provisions of this act are hereby repealed.

NORMAL STANDARD OF PHYSIOLOGY.

By NATHAN ALLEN, M.D., LL.D.

IT is admitted that Professor Huxley is the highest living authority on matters pertaining to physiology. The following table, prepared by Professor Huxley, defines the constituent elements that compose a perfect human body. It describes exactly not only all of its principal parts, but what supplies it must have, from day to day, to preserve it in a healthy state.

This table reads as follows: "A full-grown man should weigh 154 pounds, made up thus: muscles and their appurtenances, 68 pounds; skeleton, 24 pounds; skin, 10½ pounds; fat, 28 pounds; brain, 3 pounds; thoracic viscera, 3½ pounds; abdominal viscera, 11 pounds; blood which would drain the body, 7 pounds. This man ought to consume per diem, lean beefsteak, 5,000 grains; bread, 6,000 grains; milk, 7,000 grains; potatoes, 3,000 grains; butter, 600 grains; and water, 22,900 grains. His heart should beat 75 times a minute, and he should breathe 15 times a minute. In twenty-four hours he would vitiate 1,750 cubic feet of pure air to the extent of 1 per cent.; a man, therefore, of the weight mentioned ought to have 800 cubic feet of well ventilated space. He would throw off by the skin, 18 ounces of water, 400 grains of solid matter and 400 grains of carbonic acid every twenty-four hours, and his total loss during the twenty-four hours would be 6 pounds of water, and a little above two pounds of other matter."

This description represents a harmony or balance of human

organization which, we believe, has practically very important bearings. We have in this description set forth, to a certain extent, both the anatomy and the physiology of the body—the structure in the fore part, and the function in the latter part. This organization may very properly be considered the *normal standard* of the human system—that it is represented here in its best estate. While we may not, perhaps, find perfect examples—like the organization here described, we find all manner of approximations toward it. Still the standard remains the same, and upon it are based, we believe, certain great physiological laws which are fundamental and vastly important. Some of these laws we propose to notice briefly in this article, but it would require volumes to do justice to them.

1. *The Law of Health.*—In analyzing this table we might almost scientifically figure out the exact changes which cause disease. There must be, in the very nature of things, one kind or type of organization more conducive to health than another. Admitting this fact, there must be an organization of the body far better adapted to secure perfect health than all others. What, then, must be its type or character? What must be its anatomy and its construction? Is not that the standard which consists in a perfect development of all the organs of the human body, so that there shall be a perfect harmony in the performance of their respective functions? By referring to the table it will be seen at once that a change in the weight or measure pertaining to any part of the body will make a radical change in the type or standard set before us. If you change any one of these factors, you destroy the harmony or balance in the whole organism. If the structure is changed, it impairs just so much of its functions. This constitutes the entering wedge of disease. The particular kind of character of the disease must depend upon what organ or part of the body is changed. By referring to the table we find certain directions given as to the support of the body. If there is a failure to carry out these directions, or if there is any material change in the character of the supplies, disease may not at once be produced, but the vital forces of the system may be lowered, or some weakness started. The first changes may be slight in their character, but lead to serious results. Some of the gravest diseases originate from the most trivial causes.

There are, it may be said, different *degrees* of health; this fact is very obvious. What makes the difference? It is not because this or that organ alone is sounder in one person than in another. It is not simply because one person takes so much better care of himself than another, though this makes quite a difference. If we bring together all the causes or reasons, we shall find that the secret consists in the fact that the constitution of one is more perfectly and evenly developed—that there is greater harmony and completeness in the performance of the functions of all parts of the body. There must, therefore, be a *general law* regulating this whole matter of health—some standard, some type of organization better than all others. As far as figures can explain it, we find it described in the table at the head of this article. In other words, it consists in that type or standard where every organ in the human body is perfect in structure, and where each performs perfectly its own legitimate functions. In some respects the body may be compared to a complicated machine, so thoroughly and perfectly made that the "wear and tear" will come equally upon every part according to the design in its construction.

Closely connected with, and legitimately following this condition of things, we find nature has established another law, viz.:

II. *The Law of Longevity.*—Is there not some standard or model laid down by physiology itself, that shows why, in certain cases, life should be protracted to a great age? It does not depend upon food, climate, locality, race, or care, though all these may have much to do with it. Is there not an *internal factor* more potent than all these? One of the great secrets, we believe, not only of good health but of long life, consists in the harmony or balance of organization. This must apply both to structure and function. The leading vital organs should be not only sound but well balanced. The principal forces in carrying on the functions of life may be summed up under these heads: Respiration, digestion, circulation, assimilation, and secretion. Each of these departments must be well sustained in order to secure long life.

But, aside from any theory or opinion or argument, what are the actual facts—what do we find in the organization of those persons who have reached a very great age? No tables or

statistics can be given from post-mortem examinations of such cases, because attention has not been turned in this direction. But, from the physical description of a great number of very aged persons, and from careful observation also, of a very large number, we have always found that a most striking harmony or balance of the physical system prevailed. In great longevity there is uniformly found remarkable consistency or evenness in the mental, moral, and social elements of character. These traits originate from a sound and well-developed brain. This organ plays a very important part in securing longevity.

There is another argument in favor of this law of longevity —that the extremes in physical or mental development seldom reach a very great age. It should be borne in mind that the law of longevity here advocated constitutes the golden mean, or balance-wheel between these extremes. For instance, the defective classes, such as the insane, the idiotic, the deaf-and-dumb, the blind, etc., are not, as a body, long-lived. Neither are dwarfs nor giants, nor persons approximating such organizations, very long-lived.

There is another very important factor in longevity—that is, *inheritance.* Scarcely any truth on this subject is more firmly established than that the ancestry, the family, or stock has much to do with long life. Seldom, if ever, do we find a person reaching a great age without some one or more persons in the ancestry have reached a great age. What, then, is the peculiarity or type of organization here perpetuated? What are its elements that make life so long? Do we not find that they consist in a sound, healthy structure of every part of the body, and that there is a remarkable balance in all the organs, and a harmony of functions? So universally is this essential element found in persons long-lived that we question whether a single exception to the rule can be found. This leads to another application of this normal standard of physiology—that upon it is based the

III. *Law of Heredity.*—For centuries there has been more or less interest on this particular topic. A large mass of facts have been gathered upon the subject, and physiologists now generally admit that there must be truth in this matter of inheritance. Within a few years the interest has greatly increased. In the case of domestic animals the principle has

been reduced almost to a science. With some changes or modifications, the same principle which has been so successfully applied to the animal creation will apply to human beings. But before there can be great advances on the subject, we must understand heredity better—we must have some general law or principle to guide us. What we need more than anything else is a general principle or law by means of which all the facts or knowledge of this kind can be classified and reduced to some system. It is impossible to make any great advances or improvement upon the subject of heredity without such a guiding principle or standard of appeal. In the facts or phenomena of nature, there must be some general law or principle to guide us in understanding them and improving upon them. All science makes progress only in this way.

While there may be different factors and secondary causes in producing many of these hereditary phenomena, if the primary cause or starting-point could be ferreted out, we might find it to extend back several generations. All the general principles of science, when traced back to their origin, are based upon nature in its best condition. And the nearer we can go back to a perfect physical organization the less peculiarity, eccentricity, or defect shall we find. It may be we cannot explain or understand all the causes of the strange or different phenomena of character; it does not disprove but there may exist a general law somewhere. It is true, there have been different theories and speculations in accounting for hereditary influences, but we do not believe that they can all be explained so satisfactorily upon any other law or hypothesis upon the one here stated—that is, upon a perfect development of anatomy and physiology, or, in other words, that all the organs in the human body shall be so constructed that there must be legitimately a healthy performance of all their functions.

There is another important test in favor of this normal type of physiology—as far as the human body is concerned, it presents the true *standard of beauty*. Man was created with a sense of taste and love for the beautiful, which, cultivated and perfected, might find objects in nature capable of gratifying this taste to its fullest extent. Now there must be a type or

model for man, which in form, proportion, size, fulness, outline is more beautiful than all others. Is not this the same standard that Grecian and Roman artists have attempted to imitate in statuary? Has it not, in all ages, and with all nations, attracted attention? Why should it not constitute the basis or foundation for most valuable laws? But the most important law of all, involved in this physiological description, remains to be stated, that is

IV. *The Law of Human Increase.*—This law virtually controls all the others. With a change here, the conditions of health, of longevity and of heredity would necessarily be more or less affected. It is, in fact, the starting-point, the ground-work of the most important inquiries that can be raised connected with physiology. All that we can here do is to state what this law is, what some of the evidences in support of it are, and what are some of its applications. It would require volumes to do justice to the whole subject.

In the first place, there is no universal law of population that is generally admitted as such, and referred to as authority. Nearly one hundred years ago, Malthus established what he supposed a general principle to regulate population, and his theory prevailed for fifty years or more. It is discarded now by nearly all physiologists, as well as most writers on political economy. It is rare to find now any prominent writer advocating the doctrines of Malthus. The theories of Herbert Spencer on this subject have, probably at the present day, more influence than those of any other writer. The views of Spencer, unlike those of Malthus, are based upon physical organization, but are not so strictly physiological as the law here proposed. The foundation, the ground-work, of the law we advocate is based solely upon anatomy and physiology in their best estate. There are other factors, such as food, climate, exercise, and other external agents; but these are secondary.

That this law may be distinctly understood, we will describe, as briefly as possible, what is meant by it. It is based upon a normal or perfect physical standard of the human system, where every organ of the body is complete in structure and performs fully all its natural functions.. This principle implies that the body is symmetrical, well developed in all its

parts, so that each organ acts in harmony with all the others. According to this principle the nearer the organism approaches that standard, and the laws of propagation are observed, the greater will be the number of children, and the better will be their organization for securing the great objects of life.

On the other hand, if the organization is carried to an extreme development in either direction, viz., a predominance of nerve-tissue, or of a low animal nature, the tendency in such families or races is gradually to decrease and ultimately to become extinct. Thus people enjoying the very highest civilization, or living in the lowest savage state, do not multiply rapidly. It is well known that the families in Europe belonging to the nobility or aristocracy, whose nerve-tissue has become predominant by intermarriage from generation to generation, do not increase much, and not unfrequently these families become extinct. A similar result has also followed the intermarriage of relatives from the fact that the same weaknesses or predispositions to disease are intensified by this alliance. On the other hand, in case these relatives have healthy, well-balanced organizations — it may be they are cousins—they will abound with healthy offspring, and the stock may improve, and not deteriorate, from the mere fact of relationship. It explains a principle that has long been employed in the improvement of domestic stock under the terms "breeding in-and-in" and "cross-breeding."

Again: One of the strangest things has been taking place in the birth-rate of our New England people that can be found in history. It has diminished more than one-half within two or three generations, while that of the Irish, the English, and the German, living right among us, is twice as large as the American. Why this change and this difference? Making allowance for the "arts of prevention and destruction," which doubtless exist to some extent, we do not see how this great decrease of birth-rate can be accounted for, except by some radical change or difference in physical organization. In connection with this decrease of birth-rate, we find this very significant fact—that probably not half of our New England women can properly nurse their offspring at the present day. It was not so formerly, and the Irish, English, and German women find no such difficulty. Has there not been a great in-

crease of nerve-tissue among our women, and at the same time a loss of lymphatic and muscular? Some may think this change of small account, but if the very existence of a people is imperilled—at least in three or four generations—it is certainly a question of some consequence. We close with one suggestion. Man was created a free moral agent, responsible for his acts. The law of propagation is certainly very important to man in his relations to this world and the future. Must man always remain ignorant of such a law, or pass through life a mere passive agent in its administration, without definite knowledge on the subject, or intelligent motives set before him for his action? It is impossible that a wise and just Creator should ever have had such a purpose of design.—*New England Medical Monthly.*

MEAL-WORMS.—"Say, boss, d'yer want any meal-worms?" The question was put by a dirty specimen of humanity to the proprietor of a bird-store.

"How many have you got?"

"About tree tousand; all very fat."

"Let's see 'em."

The man drew two tin cans from a dilapidated coat-pocket and opened the lids. The cans were brimming full of small and lively crustaceous worms. They ran from yellow to dark brown in color, and were ⅛ inch in thickness and 1½ inches in length. The bird-fancier took one, and ate it with critical slowness. After a gulp he said:

"These are rather inferior, but how much do you want?"

"A dollar a tousand."

"All right; hand 'em over."

In answer to a question, the purveyor of worms said:

"I've caught meal-worms for ten years. Biz is generally good, and I can make $12 or $13 every week. Where do I get 'em? Why, in meal, of course! In dese big grain warehouses on the river-front, in flour-mills, and in feed-stores you can always find 'em, if you know where to look for 'em. De people wot owns dem ere places are only too glad to have a perfeshional like me come in, cos dey breed fast and eat up

lots of stuff. When I fust begun catchin' 'em de bosses used to pay me a half, but when dey found out dat I sole 'em again, dey shut down on de racket. How do I get 'em? Wid my hands, and sometimes wid a sieve. Dey generally go in gangs togedder, and when you find one of dem, you most always find fifty. I put 'em in tin mustard-boxes, which hold one or two tousand, according to de size. Some days I get tree hundred, and some days, when luck is good, I get tree tousand. Den I go round to my customers. Meal-worms are good for mocking-birds, and nearly all birds with soft bills. Meal-worms are very healthy, and taste a good deal like shrimps. Dey're hard and crisp, and very nice when you ain't very hungry. I know lots of fellers in de warehouses what eats 'em regular, and like 'em. Prices ain't very good now—not so good as in de fall. In de summer dey are quieter, and harder to get, and we put de prices up. Don't you want to try a couple? No? Well, all right, boss; we won't quarrel about it. So long."—*Sun.*

DETERMINING THE INCREASE OF THE EARTH'S TEMPERATURE TOWARD ITS INTERIOR.—According to the London *Times*, the German Government is sinking a deep shaft near Schladebach, with the especial object of obtaining trustworthy data concerning the rate of increase of the earth's temperature toward the interior. At the beginning of this year the shaft had reached the depth of 1,392 metres. The temperature at successive stages is ascertained by a special thermometer, the principle of construction being that as the heat increases the mercury will expand so as to flow over the lip of an open tube. The difference of the overflows will give the rate of increase in temperature. At the depth of 1,392 metres the temperature was shown to be 49° C., or 120° F. Should this ratio of increase be maintained, the boiling point of water ought to be reached at a depth of 3,000 metres, and at 75 kilometres (46+ U. S. miles) we should find the heat at which platinum melts. This would go to show that the earth's crust cannot be more than about one-ninetieth of its radius.

EDITOR'S TABLE.

CHOLERA AND SMALL-POX.

THE Secretary of the National Board of Health, from abstracts of the consular reports, etc., reports the progress of cholera in Spain from July 30th to September 2d, except August 30th (no report received), as follows:

Province.	Cases.	Deaths.
Albacete	6,199	2,149
Alicante	4,434	1,915
Almeria	6,470	1,913
Badajoz	474	143
Barcelona	1,651	804
Burgos	618	220
Cadiz	184	97
Castellon	6,637	2,143
Ciudad-Real	2,094	877
Cordova	2,432	942
Cuenca	6,764	2,244
Cerona	958	124
Granada	20,200	8,247
Guadalajara	700	290
Huesca	2,266	471
Jaen	1,959	1,077
Lerida	1,983	704
Logrona	1,891	496
Malaga	1,610	556
Murcia	5,149	1,913
Navarre	9,438	2,476
Palencia	2,127	373
Salamanca	295	94
Santander	54	36
Segovia	944	325
Soria	1,882	510
Tarragona	2,680	874
Teruel	12,716	4,210

Province.	Cases.	Deaths.
Toledo	5,834	2,240
Valencia	5,169	2,229
Valladolid	4,433	1,335
Zamora	2,219	411
Zaragoza	24,711	7,969
Madrid	2,750	1,491
Total reported from March 4th to September 2d	232,105	86,962

It will be observed that while the cholera appears to have declined in the number of cases since cooler weather, it has not entirely ceased in any of the places at which it has been reported, and it has continuously expanded its area—*thirty-four* centres at the latest date of this report, against seventeen at the latest date of our September number, July 30th.

The appearance of cholera at Palermo, Italy, has created a great panic among the inhabitants. The Consul at that place reports under date of September 19th, that the disease is increasing, and that about 40,000 of the citizens have fled from the city.

During the month of August, 12 deaths were reported from cholera, or choleraic diarrhœa, in London. From Bombay, for the month of July, the number of deaths from cholera was 41; Calcutta, July 25th to August 8th, 40. From Japan, "during the first six months of the current year," 16 cases and 10 deaths from cholera are reported. But the report of the "Japanese Central Sanitary Bureau," from which this excerpt is made, omits to designate the places and dates. It is also reported at Ceylon.

The Small-pox.—According to the latest reports received at the office of the National Board of Health, the epidemic of small-pox in Montreal is rapidly increasing, and the disease is spreading to the adjoining municipalities and neighboring consular districts. During the week ending September 29th, 345 deaths from small-pox were reported. Of this number, 297 occurred within the city limits, and 48 in the immediate vicinity. Small-pox made its appearance in Montreal in April last, during which month 6 deaths from the disease were reported.

In May, 10 deaths occurred; in June, 13; in July, 46; in August, 239; and from September 1st to 29th, inclusive, 821, giving a total of 1,135 deaths since the outbreak of the epidemic. In consequence of the rapid spread of the disease a provisional board of health was appointed early in September, and regulations looking to a compulsory vaccination of the inhabitants were speedily adopted. These regulations, as indeed all regulations which would enable unprotected persons to avoid infected localities, met, and continue to meet, with the most violent opposition, and at the date of the last report, much rioting had occurred in connection with the efforts of the sanitary police to carry out the orders of the board. The extent of the epidemic cannot at this time be ascertained, as by an order of the board the number of cases reported is not made public.

While Montreal is the chief centre—about 1,500 cases having been reported at that place—it has extended round about; and to Toronto, Three Rivers, Farnham, and some other places of considerable populations. It is also cropping out at several places in New England, in New York, and Brooklyn—all attributed to Canada.

From abroad small-pox is reported most prevalent in London, where there were about 300 cases in hospital, August 15th. During the week ending on that day there were 15 deaths, against 5 in the preceding week. In Paris there have been from 3 to 7 deaths weekly for the month preceding the date of latest report, September 12th, at which time there were 34 cases in hospital. In Bordeaux, also, from 3 to 6 deaths weekly for the same period. In Venice there were 6 deaths from it for the week ending August 29th. In Trieste, from 3 to 6 deaths weekly for the five consecutive weeks ending September 12th. In St. Petersburg and Warsaw, 3 to 4 deaths by small-pox weekly are reported from each. Genoa reports 2 cases and 1 death for the week ending August 30th. Antwerp reported 4 cases for week ending September 12th. From Japan, during the first six months of the current year, 4,472 cases and 1,191 deaths are reported, but the particular places of its prevalence are not designated. Its prevalence for the several months was as follows:

In January	there were	627	cases and		127	deaths.
" February	"	861	"	"	223	"
" March	"	485	"	"	225	"
" April	"	737	"	"	224	"
" May	"	777	"	"	190	"
" June	"	761	"	"	214	"

" In the report furnished to this office through the American minister, the places in which these diseases prevail are not given: Typhoid fever, 7,984 cases, 2,078 deaths; diphtheria, 1,442 cases, 856 deaths; typhus, 444 cases, 78 deaths; small-pox, 4,472 cases, 1,191 deaths; cholera, 16 cases, 10 deaths. We can, therefore, at this time, only state the facts as above given. It is probable that small-pox prevails in the seaports of the empire, and, in the absence of any indication of abatement of the disease, the adoption of careful precautionary measures on our western coast is clearly indicated."

Considering the commercial relations of the infected ports abroad with the United States, and the nature of the merchandise constantly admitted at our ports from them without disinfection, there is abundant evidence of our liability to small-pox independent of Canada. And, but for the glaring truth to the contrary, it would be difficult to imagine that any civilized government in the world would continue to practically ignore the liability of all unvaccinated persons to small-pox.

For more than a thousand years the small-pox has been known as one of the most relentless and devastating enemies of mankind, wherever it has been permitted to gain a foothold. It is everywhere known as one of the most fatal, and certainly the most loathsome, of all diseases; and no other disease is so contagious, or so universally assailing, as this: not more than five per cent. of unprotected persons exposed to it escape; and no instance is recorded where a person, unprotected by vaccination or a previous attack of small-pox, has associated in the same room with a small-pox patient without contracting the disease. Since its first recognized appearance among mankind, its victims have numbered millions.

In 1796 Jenner discovered the great fact which has immortalized his name, and been adopted by all enlightened people, that small-pox is preventable by vaccination. Yet,

even since the well-nigh universal acceptance of this truth, small-pox has slain thousands upon thousands of ignorant people in consequence of the neglect of civil governments to enforce its practice. And Canada is, to-day, what may be reasonably expected at any time in several of the Southern States of the Union, so long as they continue to neglect the vaccination of the ignorant and superstitious portion of the people *before* small-pox overwhelms them. No disquisition is necessary to show that, of all demoralizing influences which may overtake a community, an epidemic excels, and in the inverse ratio to the degree of intelligence among the people; of this small-pox has furnished numerous examples.

And as there is no disease which involves so much outthrow—so much discarding of clothing, bedding, and furniture—as small-pox, there is, in like manner, no disease which involves so much danger from the fomites thus broadcast—more dangerous than persons from the midst of an epidemic. Notwithstanding, the State Board of Health, Lunacy, and Charity of Massachusetts makes an appeal for aid to the Department of State, with reference to the epidemic in Canada, which appears to be wholly based upon the danger of personal communication, as follows:

"During the serious epidemic of small-pox of 1872 and 1873, and also in a still more marked degree in that of 1881 and 1882, unvaccinated persons coming from the Dominion of Canada were the prime cause of the spread of the disease.

"In 1881, in the town of Adams, Mass., over fifty persons contracted the disease, nearly all of whom were unvaccinated French Canadian immigrants. Outbreaks of the disease followed in Fall River, Salem, Holyoke, and other places, almost exclusively among the same class of people. Other cases occurred in Holyoke, in 1883, also among recently arrived unvaccinated French Canadians; and still others in other towns in this State, in 1884 and the present year, originated in the same manner. A family of French Canadians at Fall River, also unvaccinated, were attacked in August of this year, and two of this family have died during the past week from the same cause. Their mother had arrived a few days previously from Montreal.

"The present condition of Montreal is, therefore, a constant menace to this State, in consequence of frequent communication by various lines of travel.

"In view of these facts, we therefore request that such

measures may be taken by the General Government at the frontier as shall protect this commonwealth from danger."

Presumably the epidemic fund at the discretion of the President is available for the purpose of aiding such communities as are not able to protect themselves.

The State Board of Health of New York has issued a circular which recommends that:

"In whatever city, village, or town small-pox appears, the entire neighborhood in which there has been any communication with the patient, or exposure to contagion, shall be notified that the *State board as well as the local board of health requires that every person shall be protected by vaccination.*"

Pray, why should any city, village, or town delay vaccination *until small-pox appears?* Canada is now reaping the fruit of just such delay.

Probably not less than one-tenth of the people in the State of New York, indeed, of the whole Northern and Western, and one-third of those in the southern portion of the United States, are unprotected by vaccination. A number, at least, sufficiently large in every section to give foothold to an epidemic of small-pox, and to involve a pecuniary outlay for its suppression a thousand-fold the cost of timely measures for its prevention, and an amount of misery against which no pecuniary consideration can requite.

The penny wise and pound foolishness of waiting until small-pox appears before vaccination has often been illustrated, but never better than by Dr. Benjamin Lee, the present Secretary of the Pennsylvania State Board of Health, in regard to the epidemic in Philadelphia in 1871–72. During that epidemic there was a total of about 20,000 cases and 4,464 deaths. There was at the outset a manifest disposition on the part of the health authorities to conceal the existence of the disease, lest mercantile interests should be interfered with. Some merchants there were in Philadelphia at that time imbued with the same spirit as certain paper-stock dealers in New York at the present time appear to be, lest the effort to prevent the introduction of cholera and small-pox should possibly conflict with their business:

Exhibit of the results under the policy of Concealment and Procrastination were:		*Exhibit of what would have been the result of the policy of timely Measures of Prevention:*	
Amounts actually disbursed by Board of Health	$56,464 84	*a.* 27 vaccine physicians (18 months)	$40,500 00
Loss by diminished travel and traffic:		*b.* Expenses of vaccine bureau	1,000 00
a. To railroads	87,791 15	*c.* Salary of chief of bureau	4,000 00
a. To city passenger railroads	96,862 00	*d.* Lease of vaccine farm.	2,000 00
b. To hotel-keepers	183,936 00	*e.* Hospital for vaccinifers.	500 00
c. To retailers	306,560 00	*f.* Expense of vaccine farm	6,000 00
d. To merchants and manufacturers	4,754,000 00	*g.* Disinfecting station	4,000 00
Loss by sickness, death and disability:		*h.* Corps of dwelling disinfectors	4,000 00
a. Expense of care of sick	203,879 00	*i.* Diffusing information	1,800 00
b. Loss of time in sickness	1,072,065 00	*k.* Expenses of municipal hospital (reduced)	1,856 00
c. Loss of time by death	5,013,000 00	*l.* Loss by sickness, death, and disability	674,141 00
d. Loss of time by disability	10,000,000 00	*m.* Expense in care of sick	16,601 00
e. Expense of premature burial	74,420 00	*n.* Expense of burial	1,860 00
		o. Loss by diminished travel and traffic	00,000 00
		Balance to credit of Sanitation	$21,090,713 99
Total	$21,848,977 99	Total	$21,848,977 99

Dr. Lee, as before remarked, is now Secretary and Executive Officer of the Pennsylvania State Board of Health, and he doubtless has a lively recollection of the results of Philadelphia's neglect a dozen years ago. But the health authorities of other States, cities, villages, and towns may also profit by the example.

"SOME QUARANTINE REFLECTIONS."

Under this caption, in the *New Orleans Medical and Surgical Journal* for September, Dr. Joseph Holt renews the effort, of which we have before taken notice, to make it appear that until his advent as President of the Louisiana State Board of Health, and previous to the enforcement of *his* proposed plan for the disinfection of vessels, no infected ship "has been actually cleansed, disinfected, purged of suspicion by appliances adequate to the work," which is equivalent to saying that hitherto no ship has ever been disinfected. But his plan has

not yet been sufficiently used to prove its superiority to other methods for the use of the same disinfectants he uses, while it appears to have been made the subject of serious complaint on the part of some merchants on account of its injury to the ship and furniture. Whether this is owing to the want of skill in the application, or to possible defects in the apparatus which may render it impracticable, is yet to be shown. Notwithstanding, Dr. Holt appears to have been so well satisfied with his apparatus, even before it was tested, that he determined upon sweeping away all other means and all persons who dared to assert that a ship ever had been or could be disinfected in any other manner than that which he had devised. In the exercise of this effort, he makes the following complimentary allusion to the editor of THE SANITARIAN:

"In a recent number of one of our journals, the editor, in his intense desire to strip me of any claim to originality, informs me rebukingly, referring to sulphurous acid fumes, that *ships have been disinfected by steam* ever since 1848. Such a statement from a country bumpkin would have been silly, but coming in an editorial from one residing in the principal seaport of the continent, enjoying an abundance of practical sense, and familiar with the construction of ships, I hardly know what to make of it. As a matter of truth, *steam cannot be applied as an effectual disinfecting agent in ships*, and steam has not been the method of disinfection in any port since 1848, or any other time. *Some one* may have tampered with it, but did not disinfect."

The italics are ours. And this effort to squelch the editor of THE SANITARIAN he calls an "intense desire" on our part to *deprive him* of any claim to originality!

Conscious of having done a little something in the promotion of quarantine reform ourselves, and feeling quite sure of having disinfected several ships with and without steam, and made the process public, we venture to express our surprise at Dr. Holt's effort to wipe us out, by the following reference to his remarks in the first paragraph of this notice, as (in part) above quoted:

"From which one is led to infer that Dr. Holt and the editors of the *New Orleans Medical and Surgical Journal* have limited their observations to New Orleans." (The

editors in correspondence with Dr. Holt having appeared to us to coincide with his pretension to have been the first person who had ever used means adequate to the disinfection of a ship.)

"We confess to some surprise that these gentlemen seem never to have heard of the efficacy of steam and its easy mode of application for the disinfection of vessels, as of other things, more or less used with *certain* efficacy ever since 1848; and recently endorsed as the most efficacious of all means. But THE SANITARIAN would not be understood as belittling Dr. Holt's plan for the plenary injection of sulphurous acid or other vapors, which is an advance on the methods hitherto used for this purpose. Moreover, our own use of sulphurous acid, in *sufficient quantity*, even by cruder methods, has been so satisfactory in its results as to give us unshaken faith in its efficacy, notwithstanding the recently published results of certain experiments. In chlorine we also have implicit faith, but, when applied with sufficient potency for disinfection, it is so destructive to some materials as to preclude its use. In bichloride of mercury, or anything else, as a ship disinfectant in solution, except in vapor, we have but little confidence for manifest reasons: such substances cannot be applied to the infected recesses."

It would be an insult to the intelligence of the readers of THE SANITARIAN to enter upon such a history of the application and efficacy of steam as Dr. Holt's remarks imply an ignorance of; for, besides that early period beginning in 1848, which Dr. Holt labors to get rid of by an aspersion, when "some one may have tampered with it, but did not disinfect," the application and efficacy of steam as an effectual disinfecting agent in ships has been common knowledge among sanitarians for more than twenty years. Moreover, in Dr. Holt's description of his machinery, he leads us to infer that he has himself provided the means of using steam without the necessary knowledge for making them available. "A powerful tug-boat, provided with flushing hose, steam siphon, a battery of twelve furnaces, etc.," and "a full corps of acclimated stevedores."

Is it possible that, with such an armamentarium, Dr. Holt is indeed so much like a certain would-be literary bumpkin we once knew, who acquired the art of writing short-hand ele-

gantly, but could not translate it; and, the printer being equally ignorant, all of his work was labor lost. It may be so with Dr. Holt; unless his stevedores know more about the use of steam machinery and ships than he appears to know, his labor will likewise be lost. He has evidently not learned that flexible steam hose, manufactured under a temperature test of 380° Fahr., may be made available for boiling water in a ship's bilge, and for driving high steam through her limbers and all other spaces where infectious material is liable to lurk, with greater facility, more certain potency, at less expense, and with less delay than any other means.

ANOTHER GREAT EXPOSITION.—Prominent citizens of New Orleans and of the Mississippi Valley, feeling that its destiny had not been accomplished, that the great work it had inaugurated was not sufficiently advanced, have determined that the great Exposition shall again be opened.

A new organization, for the formation of which steps were taken long before the closing of the World's Exposition, under the name of the North, Central, and South American Exposition, has purchased the buildings and property of the World's Exposition, and will open on November 10th and continue open until April 1, 1886.

A large number of the finest exhibits, not only of private exhibitors, but State, Territorial, and international exhibits, like those of Mexico, were suffered to remain in anticipation of a re-opening. Already since the announcement hundreds of applications for space from old and new exhibitors have been received, and it is said that the complete filling with exhibits of the seventy-two acres of space covered by the buildings is certain.

Captain Samuel H. Buck, who so satisfactorily filled the position of Director-General after Major Burke's retirement, is the new Director-General, and Colonel John W. Glenn, late U. S. Supervising Architect, is the new Chief of Installation.

THE AMERICAN PUBLIC HEALTH ASSOCIATION.

THE next meeting of this Association will be held in Washington, D. C., December 8–11, 1885.

We are gratified to learn from the Secretary that this meet-

ing bids fair to be one of great interest and profit, and owing to the present general interest in epidemics, will undoubtedly be largely attended.

HEALTH REPORTS.

ST. LOUIS, MO.—By Eighth Annual Report of the Health Commissioner for the fiscal year ending April 13, 1885: "Total deaths from all causes, 7,780. The death-rate for the year is but 19.7 per thousand, as against 20.4 for the previous year. The deaths from zymotic diseases for the fiscal year were 2,214, as against 2,575.

"Scarlatina, diphtheria, croup, and whooping cough should be specially noted:

	Deaths present year.	Deaths previous year.
Scarlatina	161	267
Diphtheria	356	552
Croup	103	126
Whooping cough	26	38
Total	646	983"

Births reported for the year, and believed to be nearly complete, 9,634.

The following excerpt from the report shows a continuation of the excessive crowding of the public institutions, of which we took particular notice a year ago (Vol. xiii. p. 554). Cruel and inhuman at all times, but now, in the face of threatened cholera, it is dangerous and criminal. How it is possible for the public-spirited citizens of St. Louis to continue to tolerate such neglect on the part of the civil authorities, is beyond our comprehension:

"The City Hospital.—It stands as a monument of expedients to meet the increasing demands that have arisen from time to time, and upon the occurrence of each improvised remedies have been adopted to bridge over the pressing necessity, so that the various wards of the building are without that conformity the one to the other that is recognized as essential to a modern hospital. So of the appliances with the increasing demands for hospital treatment—they are at best makeshifts. To the humanitarian, who has made hospital architecture a

study, who has grasped the improvements of the age, who thinks space, ventilation, temperature, easy methods of access, are controlling factors in such structures, the City Hospital is but a mockery, when compared with his ideal of what a hospital should be. Each recurring year there is an increase of the number of patients who are to be cared for, and the past year is no exception; the total number of patients admitted was 6,169, against 5,414 the previous year; an increase of 755, and as against the year 1883 an increase of 1,289; since which time there have been no additions made to the hospital, then supposed to be taxed to its full capacity. To care for the sick in the limited space of the City Hospital is practically a packing process which has reached the utmost limits of the building. The report of Dr. D. V. Dean, the superintendent, fully treats of this subject, and presents most forcible reasons for the changes urged by the commissioner. Dr. Dean also furnishes a complete history of the workings of the institution, accompanied with valuable statistical information.

"The Insane Asylum is still overcrowded; 466 inmates—163 males, 303 females—an excess of 23 over the number at the termination of the previous fiscal year. The completion of the cottages relieved the main building to the extent of 70 patients, who were taken exclusively from the female department, the excess of female patients necessitating the use of one of the halls in the male wing of the main building. The use of the cottages, however, is not a solution of the problem presented by the crowded condition of the institution. The capacity of the Insane Asylum main building, with a due regard to the laws of hygiene, recognized as a controlling feature in such institutions, is estimated to be 250 patients, and at the time of its construction it was not contemplated that a greater number should be placed in the building, curative treatment being a prime factor in establishing this limit, but for years such considerations have been overlooked. The rapid accumulation of this class of public charges and the failure to provide suitable additions for their accommodation have brought about the present condition, in which we find the institution crowded to excess. No facilities for curative treatment, the great problem is where to store the ever increasing excess; with removals of incurables to the Poor-house to the number of 403,

and 70 to the cottages, there are still 163 males and 233 females in the main building, an excess of 146 above the original limit. The halls are literally packed. The floors, especially in the female wards, being nightly covered with beds, to furnish sleeping places for the patients. An addition to the present main building, or provision for the care and treatment of the excess elsewhere, is earnestly urged. The report of Dr. Charles W. Stevens, the superintendent, is replete with valuable information. The reasons urged for the provision by the State of a central institution for the care of all the incurables of the State are so forcible that nothing can be added.

"The Female Hospital is kept in perfect order. With the new appliances added during the past year, the ventilation is perfect. The water-closets with which the building has been supplied are specially adapted to hospital use and free the hospital from all offensive odors. The number of patients treated at this institution during the past fiscal year was 1,802, an increase of 240. This institution is fully in line with the other institutions—not of capacity sufficient to meet the demands made upon it." The report of Dr. George F. Hulbert, the superintendent, is an interesting résumé of the detail workings of the hospital for the past year.

"The Poor-house is but little changed from the condition presented last year. The incongruous mixture of insane and paupers still exist, aggravated by continuously increasing numbers during the past winter. The improvised pauper quarters were filled beyond all precedent. Cots had to be placed in every available spot from day to day; as the increasing numbers came it was a problem how to dispose of them. A survey of the institution thus crowded at once dispelled all illusions that the obligation of the city to properly care for this class could be met with the limited quarters to be found at the Poor-house. The necessity for some other provision for this class of city wards is evident. The incongruity of the mixture of paupers and insane is palpable to the most casual observer."

The City Dispensary, under the superintendence of Dr. W. B. Dorsett, assisted by Drs. Epstein and Priest, had the first handling of over 10,000 patients that were sent to the city hospitals, in addition to several thousand others treated at their homes.

Dr. F. T. Outley, physician to Quarantine and Small-pox Hospital, reports 104 cases of small-pox treated, 29 deaths. The disease was principally confined to colored people, among whom the answer "never vaccinated," or "no scar," is most frequently registered against their names. There had been no case within forty days last preceding the date of this report, and all for the last six months were of outside origin.

The sanitary work of the year was chiefly devoted to the abatement of nuisances, appropriations being insufficient to meet other demands. But in view of the urgent necessity, and the possibilities of cholera, the "Citizens' Sanitary Aid Association," an organization of public-spirited business men, was effected, under whose auspices an amount of intelligent work was done within the two months last preceding the date of this report, exceeding that of any two years since the organization of the Board of Health.

PROVIDENCE, R. I.: Twentieth Annual upon the Births, Marriages, and Deaths, 1884, by Edwin M. Snow, M.D., City Registrar. Population, estimated for the middle of the year, 120,000.

Births, 2,956—one in 40.60, or 24.63 per 1,000 of population. Still-births, 164. *Colored* children born, 114; estimating colored population at 4,172, one in 36.59, or 27.32 per 1,000. *Parentage*, reckoned according to birthplace of father—in each 100 born there were: American, 41; foreign, 39.78; American father and foreign mother, 8.12; foreign father and American mother, 11.10. Marriages, 1,144; one in 52.45 of the population, or 19.07 in each 1,000; 17 of the marriages were of persons who had been divorced; in three of these it was a remarriage of the same parties; 36 were marriages in which the man only had been divorced; and 38 where the woman only had been divorced; 91, or 7.95 per cent. of the whole, or about 1 in 12 of the whole number of marriages, were of persons who had been divorced.

Deaths, 2,233—19.17 per 1,000. Of the white population, 18.28; colored, 27.80 per 1,000. Of the whole number, 15.44 were caused by consumption. "In consequence, probably, to a considerable extent, of the better diagnosis and more accurate records of the deaths from consumption, there has been a large

decrease in the rate of mortality from this disease since 1855. During fifteen years, 1840 to 1854, the average annual rate was one death from consumption in 209.9 of the inhabitants; during twenty-nine years, 1856-1884, the average annual rate was one in 313 of the population." From acute lung diseases, 177; typhoidal and malarial fevers, 64; diphtheria, 58; croup, 33; scarlatina, 57; diarrhœal diseases, 198.

PATERSON, N. J., September 26, 1885.

DEAR DOCTOR: In "mortality statistics," in September SANITARIAN (p. 284), you put the population of Paterson at 57,000, and the death-rate 32.7.

The State census, taken July, 1885, gives us a population of 63,287, which of course reduces the death-rate. Our rate is high enough, without charging us with 32 per 1,000 per year.

Yours truly, WILLIAM K. NEWTON.

VITAL STATISTICS OF IMMIGRATION.

NAMES OF STEAMERS, DATE OF ARRIVAL, PORT OF DEPARTURE, NUMBER OF PASSENGERS, NUMBER OF DEATHS AND BIRTHS DURING THE VOYAGE FROM EUROPEAN PORTS TO NEW YORK, FOR THE MONTH OF SEPTEMBER, 1885.

Arrival.	Vessels.	From.	Passengers.	Deaths.	Births.
Sept. 7,	Rugia,	Hamburg,	624	1	
" 9,	Wisconsin,	Liverpool,	713	2	1
" 9,	Fulda,	Bremen,	683	1	1
" 11,	Republic,	Liverpool,	709	1	
" 11,	Belgenland,	Antwerp,	471		2
" 15,	Rhaetia,	Hamburg,	319	1	
" 12,	Wieland,	"	533	1	
" 19,	Hammonia,	"	764	1	1
" 19,	Eider,	Bremen,	882	1	
" 20,	Thingvalla,	Copenhagen,	216	1	
" 23,	Westernland,	Antwerp,	668	1	
" 26,	Neckar,	Bremen,	663		2
" 26,	Werra,	"	891		2
" 27,	Frisia,	Hamburg,	317	1	1
" 27,	P. Caland,	Rotterdam,	251		1
" 27,	Adriatic,	Liverpool,	741		1
" 30,	State of Penna.,	Glasgow,	196	1	
" 30,	Amerique,	Havre,	293	1	
			9,934	14	12

MORTALITY STATISTICS IN THE UNITED STATES.

MONTH OF AUGUST, 1885. Correspondents under this head will please send reports promptly.	Total Deaths.	Deaths under 5 years.	Lung Diseases.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
Burlington, Vt., 13,300	...	...	...	..	..	..	..	..	..	..	....
†Lowell, Mass., 64,051	122	63	6	2	..	..	..	3	..	86	...
†Worcester, Mass., 68,383	136	86	10	5	..	..	..	1	..	60	25.8
Providence, R. I., 117,607	178	67	33	3	1	1	5	5	..	32	18.1
New Haven, Ct., 78,000	111	50	24	2	..	1	2	7	..	23	17.0
New York, N. Y., 1,397,395	2,991	1,477	628	117	16	17	82	86	..	675	25.6
Brooklyn, N. Y., 665,602	1,370	719	242	39	24	4	24	44	..	342	24.7
Buffalo, N. Y., 205,000	...	...	...	..	..	..	..	..	..	..	....
Long Island City, N. Y., 21,000	...	...	...	..	..	..	..	..	..	..	....
Albany, N. Y., 95,000	163	68	31	18	3	..	2	6	..	24	20.3
Yonkers, N. Y., 22,000	24	29	10	2	..	..	..	4	..	19	39.4
Cohoes, N. Y., 20,000	47	27	11	1	1	..	..	4	..	14	28.2
Troy, N. Y., 60,000	99	35	23	2	..	..	..	5	..	21	19.8
Syracuse, N. Y., 65,000	117	63	12	1	1	..	..	2	..	40	21.6
Utica, N. Y., 39,000	80	32	13	1	..	..	..	10	..	23	24.6
Auburn, N. Y., 26,000	47	17	9	2	..	1	..	..	..	15	21.7
West Troy, N. Y., 13,000	33	12	7	6	..	..	..	4	..	4	30.4
Rochester, N. Y., 101,000	204	99	40	9	..	..	..	2	..	48	24.2
Kingston, N. Y., 20,000	32	21	7	..	2	2	..	3	..	9	18.1
Newburg, N. Y., 20,000	28	15	5	2	..	..	..	3	..	5	16.8
Poughkeepsie, N. Y., 20,207	32	13	4	1	..	..	..	1	..	8	19.0
Oswego, N. Y., 24,000	28	12	5	..	..	..	..	..	..	8	14.0
Lockport, N. Y., 16,000	9	5	1	..	..	..	..	..	..	4	6.7
Binghamton, N. Y., 20,000	34	17	3	..	..	..	..	1	..	7	20.4
Elmira, N. Y., 25,000	36	14	6	..	..	..	..	2	..	7	17.2
Hudson Co., N. J., 213,000	...	...	...	..	..	..	..	..	..	..	....
Paterson, N. J., 63,281	107	52	14	4	..	..	1	3	..	20	....
*Philadelphia, Pa., 949,432	2,228	1,059	291	62	14	5	22	83	..	359	23.7
*Pittsburg, Pa., 180,000	451	267	49	20	19	2	9	21	..	..	23.6
Erie, Pa., 36,000	66	41	12	..	..	..	2	4	..	28	....
Wilmington, Del., 53,500	86	48	8	2	..	..	..	2	..	16	19.0
§Cincinnati, O., 325,000	194	88	36	5	..	..	..	5	..	34	15.5
Toledo, O., 52,000	87	46	7	1	..	..	..	1	..	28	14.8
Detroit, Mich., 165,000	...	...	...	..	..	..	..	..	..	..	....
*Rock Island, Ill., 11,650	16	12	1	1	..	..	..	..	..	5	14.2
Chicago, Ill., 630,000	1,188	742	124	60	13	7	13	101	..	285	22.6
St. Louis, Mo., 400,000	758	378	115	42	5	..	5	60	..	118	22.4
Milwaukee, Wis., 160,000	331	113	30	11	3	6	..	7	..	80	24.8
San Francisco, Cal., 235,000	455	...	87	28	..	1	..	15	..	22	....
Minneapolis, Minn., 129,200	160	97	18	2	..	1	2	17	..	44	14.7
St. Paul, Minn., 111,394	145	93	30	3	5	..	..	6	..	39	10.5
*Baltimore, Md., 408,520	839	412	129	25	6	3	12	32	..	171	21.0
Dist. of Columbia, 200,000	...	...	...	..	..	..	..	..	..	..	....
Richmond, Va., 75,000	...	...	...	..	..	..	..	..	..	..	....
*Lynchburg, Va., 23,000	36	17	6	..	..	..	..	..	..	9	16.2
New Orleans, La., 234,000	494	196	84	10	1	..	3	54	..	39	25.3
Nashville, Tenn., 50,000	117	49	21	8	1	..	1	7	..	23	23 2
Mobile, Ala., 31,295	84	31	15	7	..	..	..	13	..	2	32.1
Savannah, Ga.	85	35	9	3	1	..	1	12	..	7	24.1

* 6 weeks: † 4 weeks: § 2 weeks.

MORTALITY STATISTICS ABROAD.

FIVE WEEKS ENDING AUGUST 25, 1885.	Total Deaths.	Deaths under 1 year.	Bronchitis and Pneumonia.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Typhoid and Typhus Fevers.	Cholera.	Diarrhœal Diseases.	Annual rate per 1,000.
London, 4,083,928.....	7,786	2,872	712	132	71	271	215	63	45	1,228	19.9
Liverpool, 579,724.....	1,274	413	...	10	14	60	85	15	..	169	22.9
Glasgow, 517,941.....	1,165	339	146	16	18	7	38	9	..	157	22.9
Birmingham, 427,769...	800	312	...	3	3	18	18	6	..	148	19.5
Dublin, 353,082.....	756	163	63	2	14	9	8	13	..	30	24.5
Manchester, 337,342....	880	231	...	..	3	45	16	4	..	78	25.0
Leeds, 333,139.....	680	287	...	1	15	4	4	12	..	138	21.3
Sheffield, 305,716.....	633	229	...	1	13	13	29	4	..	105	23.6
Edinburgh, 246,703....	397	88	84	11	1	1	5	10	..	35	16.4
Belfast, 219,232.....	533	131	72	4	9	28	22	6	..	35	28.3
Bradford, 214,431.....	336	106	...	..	3	..	8	5	..	34	15.3
Hull, 168,292.....	286	74	...	..	3	..	2	5	..	17	16.0
Newcastle, 153,209.....	371	122	...	..	.2	23	2	4	..	47	25.2
†Havre, 105,867.....	144	60	19	4	..	1	3	5	..	27	35.3
Rheims, 93,823.....	383	178	20	5	..	1	3	46	..	164	42.2
*Nancy, 76,358.....	175	64	7	..	..	8	3	5	24	30	23.6
Breslau, 295,000.....	908	440	45	14	2	1	15	5	..	204	31.8
Brussels, 175,811.....	407	118	41	14	9	..	6	2	..	99	22.2
Cologne, 153,500.....	502	242	23	2	..	1	10	7	..	171	34.2
Christiania, 126,000....	264	91	12	39	9	..	2	1	..	70	19.5
FOUR WEEKS ENDING AUGUST 15, 1885.											
Frankfort, 147,900.....	213	71	24	5	..	1	..	3	..	41	17.0
Hanover, 135,400.....	275	145	17	5	5	5	..	1	..	67	20.2
Bremen, 121,550.....	145	41	20	2	..	..	..	..	..	8	15.2
Dantzic, 119,240.....	232	111	9	6	4	1	..	5	..	47	25.3
Stuttgart, 110,918.....	212	83	11	1	..	..	..	..	..	40	21.1
Strasbourg, 110,739....	281	150	16	3	..	..	..	6	..	81	32.4
Dusseldorf, 110,033....	264	144	21	2	2	..	..	1	..	69	31.2
Nuremburg, 107,132....	259	127	21	12	1	..	..	..	..	63	31.4
Chemnitz, 106,163.....	334	220	8	12	1	1	1	1	..	9	42.2
Magdeburg, 109,000....	306	167	19	10	2	15	..	4	..	37	36.4
Elberfeld, 103,200.....	179	70	25	4	2	..	..	4	..	34	22.5
Barmen, 102,000.....	151	74	7	5	10	..	..	3	..	11	24.2
Altona, 98,550.....	191	81	20	8	3	1	..	4	..	42	25.1
Aix-la-Chapelle, 90,300.	274	180	15	..	..	..	..	..	..	80	39.6
Mayence, 65,000.....	120	48	9	1	5	..	..	1	..	5	22.2
Amsterdam, 361,314....	509	...	...	8	10	4	7	3	..	1	16.9
Rotterdam, 166,001....	223	...	...	..	4	1	..	..	..	3	17.1
The Hague, 134,552....	211	...	...	4	1	..	11	1	..	2	20.3
Lyons, 376,613.....	707	...	55	5	1	1	3	21	35	127	24.6
Berlin, 1,263,455.....	2,959	1,612	184	93	27	29	..	24	..	713	30.4
§Hamburg, 497,956....	689	328	25	24	7	3	7	13	2	175	24.0
Dresden, 241,500.....	508	347	43	18	1	..	..	4	..	84	27.3
Munich, 244,000.....	651	367	42	11	3	..	2	6	..	257	34.6
Leipzig, 168,976.....	291	149	24	11	..	2	..	..	..	30	24.8
Königsburg, 157,660 ...	410	191	16	14	..	..	..	3	..	122	33.8
‡Bucharest, 200,000....	196	68	24	12	6	..	1	1	..	32	25.4
Paris, 2,239,928.....	3,735	803	235	74	20	64	16	140	..	586	21.5
Calcutta, 433,219.....	800	...	...	..	..	..	..	221	108	...	24.0

* 4 weeks; † 2 weeks; ‡ 5 weeks ending July 25, 1885; § 8 weeks.

LITERARY NOTICES.

THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS, Edwin Chadwick, C.B., President. London, pp. 20. The Celebration of the Second Anniversary Dinner of this Association, June 6, 1885, seems to have been characterized by the same good-fellowship as the first, presided over by Edwin Chadwick, C.B., attended by Capt. Douglas Gatton, C.B.; Dr. Cameron, M.P.; Dr. Richardson, F.R.S.; Dr. Alexander Bain, Lord Rector of Aberdeen; and many other distinguished dignitaries and sanitarians connected with or interested in the objects of the Association. The dinner speeches were hearty and decidedly healthy.

LOUISIANA STATE MEDICAL SOCIETY TRANSACTIONS, April 21–23, 1885. Pp. 182. P. B. McCutchon, Secretary, New Orleans. The Annual Address of the President, Dr. R, H. Day, on the "*Mission and Methods of Medicine*," while reviewing the progress of medicine generally, pays a worthy tribute to *Preventive Medicine* as "a necessity of the age, and, perhaps in the near future, the great medical system of the world. Not so much how to cure diseases, but how to prevent them." The address, throughout, is suggestive of much practical knowledge on true medicine in its most beneficial relations. The Annual Oration, by Mr. W. H. Goodale, concludes with numerous cogent questions whether laws should be passed in the interest of public health, regulating the sale of poisons; requiring instruction in hygiene in public schools; compelling the observance of Sunday as a day of rest; requiring stricter quarantine regulations; for the cremation of waste products and the dead; for compulsory vaccination; for the prevention of the present filth-inducing system of surface drainage in New Orleans; to enforce strict cleanliness; for compulsory drainage of marshes and low lands; for regulating public prostitution and the prevention of debauchery; for the sanitary regulation and supervision of public institutions; to regulate vivisection—all important questions well put. Besides which there are several papers on subjects of importance to all medical practitioners.

SANITARY REVIEW OF THE SESSION. By Edwin Chadwick, Esq., C.B., President. Read at the Monthly Meeting of the Association of Public Sanitary Inspectors, London, May 2, 1885; is a pamphlet of eleven pages, possessing the comprehensive characteristics, common to the author, on the general subject of sanitation, with particular reference to the pending necessity of additional works for the disposal of London sewage.

ALBANY WELL-WATERS.—Of 36 wells reported upon by Dr. Willis G. Tucker to the Board of Health of Albany, in July last, there are classed as good, 3; fair, 5; doubtful, 13; bad, 15. It is recommended that all of the last be closed at once. It would be safer also to close the "doubtful," and of the rest, that they should be examined at some future time. Several of the "bad" contain enormous amounts of free ammonia, equal in some cases to ordinary samples of sewage.

It is the more unfortunate that, according to last accounts, the river water-supply was also "bad."

ILLUSTRATED NEW MEXICO, HISTORICAL AND INDUSTRIAL. BY WM. G. RITCH. Fifth edition. Santa Fé, N. M. Bureau of Immigration.

This is a business publication which contains many illustrations, a map of the Territory, and over two hundred pages of descriptive matter respecting the resources and advantages of the Territory at large and of each county respectively. It tells about the mines and cattle ranges, agriculture, pomology, and viniculture, and the climate, mineral springs, health and pleasure resorts.

A GUIDE TO SANITARY HOUSE INSPECTION; OR, HINTS AND HELPS REGARDING THE CHOICE OF A HOME IN CITY OR COUNTRY. By WILLIAM PAUL GERHARD, C.E., Consulting Sanitary Engineer; Author of "House Drainage and Sanitary Plumbing," "Hints on the Drainage and Sewerage of Dwellings," and "Diagrams for Sewer Calculations." 12mo, pp. 145. New York: John Wiley & Sons.

Like the previous manuals by the same author, this is an excellent summing up of the subjects of which it treats from a strictly practical point of view, commendable alike to the sanitary inspector and the householder.

THE SANITARIAN.

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SOME OF THE RESULTS OF PRACTICAL SANITATION IN ENGLAND.*

THIRTY YEARS' PROGRESS OF SANITARY REFORM.

By PROFESSOR F. S. B. F. DE CHAUMONT, M.D., F.R.S.

IN his opening address before the Sanitary Institute, the president, Professor de Chaumont, reviewed the progress of sanitary reform during the past thirty years, and the progress of the Sanitary Institute. In the course of his farther remarks, he said it was a remarkable fact that at present there was no official recognition of the competency, or the necessity for the competency, of any of the officers connected with sanitary work. The medical officer of health, the local surveyor, and the inspector of nuisances, might, each and all, be appointed without showing any proof of sanitary knowledge; and were, indeed, sometimes appointed without the possession of it. To remedy this, the universities, and other corporations granting diplomas in medicine, offered certificates of proficiency to medical men who passed the prescribed examination. Those certificates were not yet rendered compulsory, but they trusted they might be so ere long. Until, however, the Sanitary Institute stepped forward, there was no similar means applicable

* Abstract of Proceedings of the Eighth Annual Congress of the Sanitary Institute of Great Britain, held at Leicester, September 22–26, 1885.

to the local surveyors or inspectors; but now for a number of years periodical examinations had been held, and the increasing number of candidates had shown the growing appreciation of the value of the certificates offered. As to the necessity of them he could vouch personally, for he had been for a number of years an examiner, both of that Institute, and also of other public bodies granting certificates to medical officers; and in all the different classes of candidates ignorance had been displayed, by some at least, to a degree that would be surprising to those inexperienced in such matters. They earnestly hoped that the time was not long distant when it would be compulsory on all sanitary officials to show undoubted proof of their competency for office before being intrusted with the health of the people and the expenditure of their money. There was, however, another point in which reform was required, and that was the appointment and tenure of office of medical officers of health. Whilst they ought to insist upon their giving proofs of their competency, they must make their posts such as would be worth holding by men of special knowledge and training. The present system of uncertain tenure must be abolished, as well as the practice of appointing men in medical practice to small districts at a nominal salary. The country must be divided into large combination districts, so as to be sufficient to occupy the entire available time of a competent medical officer, who should be well paid, and irremovable except by the Local Government Board on good cause shown and ample inquiry. As a nation they were paying yearly an enormous sum for their sanitary shortcomings, a sum undoubtedly less than they used to pay, but still very large; a sum, too, that would rapidly increase if vigilance were in any way relaxed. It was the aim and object of sanitation to reduce, and, if possible, to extinguish, this gigantic burden, which represented about one-sixteenth of the entire taxable income of the country. But even that was not all; for, besides the immediate losses from sickness and mortality, they had the remoter effects in weakened health and enfeebled offspring, every lowering of the health standard preparing a fertile soil for future disease and the perpetuation of the scourges of humanity. Most sanitarians agreed that the death-rate was capable of being reduced to 15 per 1,000 by the reduction of preventable disease. In that case the mean

duration of life would be 54 years instead of 41 ; whilst a reduction to 12 per 1,000 would raise the mean duration of life to 65 ; 11 would raise it to 70 ; whilst a ratio of 8 per 1,000—a rate seriously contemplated by Mr. Chadwick—would bring it up to 93, and a fractional amount below 8 would establish the ideal 100 years, which was now held to be the normal life of man. He had spoken chiefly of general death-rates, but those, although valuable, were less sure marks of improved sanitation than particular death-rates, and more especially those from particular classes. The three most significant were —(1) the deaths of children ; (2) the deaths from consumption ; and (3) those from zymotic disease. They were the most significant because they were the most preventable by hygienic measures. It would be impossible to do more than say a few words about each. As regarded the death-rate of young children, the large preponderance of their deaths was still a blot upon our social system, and he was sorry to see that Leicester had an unfortunate notoriety in that direction. For almost all zymotic diseases children formed the most sensitive barometers, and they were generally the first to show symptoms of derangement if unsanitary conditions were present. One of the most constant of children's disorders was diarrhœa, with which was associated typhoid fever, often returned formerly as infantile remittent fever. That diarrhœa was partly due to insufficient and improper feeding, but it was also largely dependent upon unsanitary conditions connected with bad drainage and impure water-supply. The second group of importance was that of consumption, the disease of all others most constantly fatal, if they excepted diseases of the lungs and air-passages other than consumption. About 18 per cent. of all deaths were due to diseases of the respiratory system generally, and about 10 per cent. to consumption. In later years the ratio has somewhat diminished, and that fairly steadily. Now, what were the causes of consumption ? Three main causes had been assigned, viz. : (1) Hereditary predisposition ; (2) faulty nutrition ; and (3) impure air. He did not propose to discuss the first cause, but would only say that the fact of hereditary predisposition was pretty generally recognized, and that it was only by improved sanitary conditions that there seemed any chance of mitigating or extinguishing it. Of

the second cause much had been written; and there could be no doubt of the fact that faulty nutrition was a very important factor. Indeed, one physician attributed consumption to the high price of butter in England; and the success which had attended the administration of additional digestible fat, in the form of cod-liver oil, was a proof so far of the correctness of the opinion. But the most important factor of all was undoubtedly the third, namely, impure air—the rebreathing of air already charged with the impurities of respiration and transpiration. Such impurity appeared especially to favor the growth of the bacillus which had been shown to be the probable active agent. He thought they might, therefore, justly infer that the diminution in consumptive complaints was due to the improvement in the well-being of the community and the better housing of the poor. Consumption, however, was a disease of the rich as well as of the poor; and in the case of the former it had been largely favored, if not caused, by their being too well housed, in the sense that there had been too great a barrier between their living and sleeping rooms and the external air. The best security against the development or propagation of the disease was free ventilation, and the avoidance, of course, of chilling draughts. The third group of importance was that of fevers. And here they were met with some difficulties in making comparison with the older statistics, in which the different kind of fevers were less clearly defined. Under this head there were three distinct forms, viz.: Relapsing or famine fever, typhus fever, and enteric or typhoid fever, besides an anomalous class called common continued fever; which would probably diminish or disappear as diagnosis became more accurate. Enteric or typhoid fever, which was, up to forty years ago, confounded with typhus (and is still called abdominal typhus on the Continent), was the most important of the fever class. That disease they now knew owed its origin to bad drainage or insufficient removal of excreta. It turned up in all parts of the world. Its presence was a very sure indicator of unsanitary conditions. It attacked the young by preference, although the old were not entirely exempt from it, and it was as much a disease of the palace as of the hovel. But they would find a sensible diminution in the enteric rate, for in 1869, the first year in which it was separated, the deaths were 390 per million living;

whereas in 1881 there were only 212, a fall of 46 per cent., or 44 per cent. if they allowed for the former erroneous return of cases among children as remittent fever. That improvement meant emphatically improved drainage and excreta removal, but the fact that they still lost some 5,000 or 6,000 lives per annum in England and Wales alone showed how much still remained to be done. There was another disease, however, which carried to the public mind a much greater dread than even fever, and that was epidemic cholera, which had lately committed such ravages in Spain, and might possibly reach these shores by and by. The terror which cholera inspired was due to the appalling suddenness of its invasion, as well as to its great proportionate mortality. The normal death-rate in this country was about 16,000 a week; if cholera prevailed in the same ratio as in Spain we should be losing some 25,000 a week from that cause alone, and the total death-rate would be between 40,000 and 50,000. That naturally led them to consider what condition they were in to resist this formidable invasion. Cholera had visited Europe six times, including the present epidemic, viz., in 1832, 1849, 1854, 1866, in which years it prevailed in this country; but in 1873, and up to the present time in the existing epidemic, it had not been able to make good a footing. The impressive onslaught of cholera had roused them from time to time to more vigorous action; to such an extent, indeed, that they might say that cholera had been more of a blessing than a curse, and that it had saved many more lives than it had killed. The action which was found necessary on its account had been fruitful in diminishing other diseases favored or propagated by unsanitary conditions. The epidemic in the year 1849 was the most severe wave of cholera that had ever spread over the world, and the mortality of that year was the highest we have had. In 1854 the loss was very much less, and in 1866 it was smaller still. In 1873–75 the disease was spread over the continent of Europe, but, although frequently introduced into this country, it never managed to find a foothold. And in the present time the disease had existed since 1882 in Egypt, Italy, France, and Spain, but it had not established itself here, in spite of our constant intercourse with those countries. The result was doubly interesting, because it proved, on the one hand, the

utter futility of quarantine by land or sea; and, on the other, the paramount importance of hygienic measures. Quarantine had never been practised by us since 1832, and even then it was only in a partial way. In other countries where it had been rigidly and vexatiously exercised it had been quite inadequate to keep out the disease. In fact, it had tended to foster it and to increase the danger. The truth is, it was wiser to render the soil sterile to the seed than to try vainly to keep out the seed by clumsy expedients which were about as efficacious as if a tortoise were set to catch a butterfly. They had wisely in this country devoted their expenditure to internal sanitation, to the provision of pure water and good drainage, and such other matters of sanitation as had been found practicable. He hoped they would continue on that path; remove dirt where they could, and generally wash and be clean. Judging from the past, he thought they might have good hope for the future, for they were far better situated for resisting an epidemic than they ever were before.

With reference to vaccination, Professor de Chaumont said he was not going to enlarge upon the subject, but took the opportunity of making it distinctly understood what his views are, viz., that vaccination is one of the greatest boons ever conferred upon humanity, and in saying that he believed he expressed the views of the Council of the Institute. That town had constituted itself a principal centre of opposition to vaccination, and insisted that ordinary sanitation was sufficient to prevent small-pox. With special regulations and strict isolation he believed they had been able to keep the town very free from it. He should be but a bad sanitarian if he did not recognize the value of both those measures, but they were working now with a population that was for the most part already vaccinated. What it might be when an unvaccinated population had accumulated was a very different thing, and he feared they would have a rude wakening.

THE SAVING OF LIFE BY SANITARY ASSOCIATIONS AND PRACTICAL SANITATION.

On Wednesday, September 23d, Dr. A. Ransome, F.R.S., of Manchester, President of the Section devoted to Sanitary Science and Preventive Medicine, delivered his address. He

said it was desirable that, in its brief periodical visits to the principal cities and towns of the country, the Institute should, if possible, leave behind it some abiding and growing influence. When he was first asked to undertake his present duties, it was his wish to conduce to this end by advocating the establishment in each town visited by the Institute of some local sanitary association, similar to the one with which he was connected in Manchester, that had now been at work in that city for more than thirty years. If this suggestion were adopted, there would then be scattered over the country permanent and, they might hope, active associations, each of which would carry on the objects of the Institute, and that would prevent their visits from becoming merely a "three days' wonder," and their influence from quickly dying out. In his opinion few places in England would be so likely as Leicester to benefit from the establishment of such an institution in its midst. From the Registrar-General's last annual return, it appeared that the mortality in Leicester of infants under five years of age was over 500 per 1,000 deaths—more than one-half of the total mortality—and during the month of July the *Sanitary Record* noted no fewer than 100 deaths from diarrhœa, an eminently preventable disease. Such a fearful mortality as that must be due to something wrong in the place itself, and it surely behooved the inhabitants of Leicester to take measures to remove such a reproach to their humanity as soon as possible. One of the best means for this purpose would be, he believed, the formation of an influential voluntary sanitary association. Proceeding with his general subject, Dr. Ransome said that within the last ten years a striking change had taken place in the general death-rates. A saving of life to the extent of three-fourths of a million persons in a decade may now be reckoned up from the pages of the Registrar-General, and the diminution in certain classes of disease pointed unmistakably to the influence of measures of preventive medicine. Thus a comparison between the ten years, 1861–70, and the three years, 1881–83, shows that the annual saving of life in small-pox had been 2,444; measles, 1,898; scarlet fever, 11,934; fevers, 15,418; diphtheria, 1,222; cholera, 2,470; diarrhœa, etc., 6,942; phthisis, 16,692; other tuberculous diseases, 1,170—total, 80,190. In the army the deaths

were at one time three or four times the rate of the ordinary civil population, and this was solely due to the unwholesomeness of the barracks in which those men had to live. Since then the improvement had been so great that the Abyssinian campaign was conducted to its close without the loss of a single man from disease; and in 1883 the deaths of soldiers in the United Kingdom had fallen to 6.28 per 100, and throughout the world to only 9.57. In the navy, again, in 1779, 70,000 men were voted for the service, but of these 28,592 were sent sick to the hospital, and 1,658 died. But in 1883 the death-rate was only 5.88 per 1,000 in all, and only 4.05 from disease alone. In prison, again, there were 176 deaths out of 632 from August, 1776, to March, 1778. But in 1883 the death-rate was only 7.8 per 1,000, or about the same as the rate of the general civil population between the ages of 21 and 50. In the times before vaccination, small-pox had often ravaged more fiercely than the most ruthless of human wars; but according to a late return only 68 persons per million died from it. Again, no death had occurred in the Prussian army since 1874 from small-pox; but in both the Austrian and French armies it led to a considerable mortality. No other reason could be given for that striking difference except the working of a strictly carried out inoculation and revaccination.

Turning to the diminution of consumption and the question of its preventability, Dr. Ransome related his own experiences at Bowdon. "I had noticed," said he, "that the disease was comparatively infrequent in the place in which I myself live, and it occurred to me that I might ascertain how many cases originated in the different parts of the locality. A great portion of it is composed of deep porous soil, but it is surrounded by boulder-clay, the result of glacial drift, and a great part of Bowdon and parts of Dunham and Altrincham are built upon a thick bed of sand, in many places over one hundred feet in thickness. The climate is thus rendered more temperate and the air and soil drier. The sand is as pure and free from organic matter as in the days when it was deposited by ice-floes or was silted up by the estuary of the Mersey. No house is ever built upon freshly made ground or in pits that have been filled up with refuse. The locality is also well sewered, and has a plentiful supply of good water. I obtained

from the Superintendent-Registrar of Deaths an extract from the death-register of all the deaths from diseases of the lungs occurring in Bowdon in the ten years 1875–84. Of these 22 were from phthisis; but 11 of them took place in the low-lying clay lands around Bowdon, and 9 of the remainder were found to have contracted the disease before coming to Bowdon. This leaves two to be accounted for, and one of these was the secretary to the City Mission in Manchester, who was therefore constantly obliged to attend crowded evening meetings in different parts of the town. The other was a merchant's clerk, who went to town at eight every morning, and did not return until 7 P.M. Such a record as this is a strong testimony to the truth of the observations made by Drs. Bowditch and Buchanan as to the influence of a well-drained porous soil upon the disease, and it holds out to us the hope that when farther attention is paid to this point a large part of the terrible mortality that still takes place from this disease may be prevented, and that consumption may cease to be, as it has been called, 'the scourge of the English people.'"

INFANTILE DIARRHŒA.

Dr. E. W. Buck, of Leicester, read a paper on "Infantile Diarrhœa." He referred, first, to the peculiarities of the death-rate from this source, and then to the question of whether diarrhœa was one or many diseases, or merely the symptom of a disease, contending that diarrhœa is more than a symptom; it is a disease of itself, of which an apparently healthy child may die in one, two, three, four, five, six days, or under a week after seizure. As to the causes of it, he said: My father, when Medical Officer of Health for Leicester, in 1852, writes in his report: "Without denying the influence of weather and seasons, I am of opinion that this disorder is mainly produced by organic decomposition. Its victims will be found to be, exclusively, the very old and the very young —those who, from inherent debility, are more confined to the vicinity of their own dwellings; thus becoming, as it were, doubly liable to an endemic disorder—the manner of its seizure oftentimes being sudden, like a lightning stroke, and its speedy development (prolonged a few hours, certainly,

beyond the Asiatic cholera), appears to me more nearly to indicate the presence of an organic poison than any other source that could be devised as its probable origin." This view only confirms the opinion I have formed from my own observation, namely, that there is a specific diarrhœa which is present in those towns which have a high diarrhœal rate, and absent from those places where the rate is so low that the few cases registered are probably due to diarrhœa produced by some other disease.

In the discussion which followed, the view was expressed that a polluted soil, acted upon by heat, together with improper feeding of children, were the main causes of the infantile diarrhœa which prevailed so largely in Leicester.

VACCINATION *v.* ISOLATION AS A PREVENTIVE AGAINST OUTBREAKS OF SMALL-POX.

A paper on this subject was read by Surgeon-Major R. Pringle, M.D., late Sanitary Department, H.M. Bengal Army. He said small-pox, as met and defeated by vaccination, occupied a unique position under the head of preventive medicine, adding that the subject possessed a peculiar, indeed special, interest and importance to the town of Leicester; the inhabitants of this town, as was pointed out, being under the impression that by means of isolation the Sanitary Committee had succeeded in "stamping out" small-pox, and they were enabled thereby to prove that vaccination was not necessary, if they had conscientious scruples regarding its adoption. Dr. Pringle, while fully admitting from the result of his own experience at Morar-Gwalior, in 1863, when vaccination was not practicable owing to the heat of the weather, that it was quite possible to stamp out small-pox in a given locality by isolation and treatment of the cases, and disinfection or destruction of all substances likely to retain or convey contagion or infection, showed that this success in Leicester in reality depended not so much on isolation as on the benefits conferred in past years by vaccination; which, notwithstanding all the charges brought against it, thus returned good for evil by limiting the number of cases to be treated and isolated, and, as a natural consequence, the amount of contagion and infection to be destroyed. Dr. Pringle, after quoting from Mr. Ald. Windley's letter to a

provincial journal, argued that the possibility of carrying out these preventive measures with any hope of success depended on the cordial assistance and concurrence of all concerned, and particularly of the family in which the case of small-pox might appear. The following were the measures alluded to in Mr. Windley's letter of February, 1885, and as they are the basis of the preventive measure termed isolation, as opposed to vaccination, they were given *verbatim:* "I may say we not only remove any case of small-pox to hospital at once, but we also persuade all the persons who have been found in the house at the time to take up their abode in a separate ward at the hospital for fourteen days' quarantine; in the meantime thoroughly disinfecting bedding, clothes, and house from which the patient was removed." Much of the opposition to vaccination, Dr. Pringle observed, would be found to lie in the trouble and distress undergone by the parents when their children suffered from unhealed, it might be ulcerating, vaccine cicatrices; due, too often, to the vesicle being injured, and then heat, flies, and dirt lighting up a severe inflammatory action. As regards the introduction of other diseases with the vaccine lymph, Dr. Pringle had never, in his extensive practice, seen a single case of this, and he was satisfied that what was often witnessed in these cases was due to that which was inherited, and not inserted.

In the discussion, Professor Corfield, Sir Charles Cameron, Dr. A. Carpenter, Professor De Chaumont, and Dr. Ransome strongly insisted on the value of vaccination, and pointed out that the immunity from small-pox now enjoyed by Leicester, and attributed to isolation, was largely due to the protection afforded by the general vaccination of the present adult population. If the inhabitants generally refused the protection of vaccination for their children, a terrible penalty awaited the town in the future.

IMPEDIMENTS TO SANITARY PROGRESS.

A paper on this subject was read by Mr. Lewis Angell, M. Inst. C.E., Fellow of King's College, London, who explained that sanitary progress meant the elimination of extraneous preventable causes of disease, and the object of the

paper was to illustrate some of the difficulties of putting into effective practice those abstract principles of sanitation upon which they were agreed. Among them he mentioned defective legislation, and the inability to compel local authorities to do their duty. The repugnance of self-taxation was another great difficulty the sanitarian had to encounter. To the mere "rate-payer," sanitary science meant officials, public works, and taxation; an investment which gave no dividend—matters which might be postponed. The value of health, comfort, and prosperity, or the loss of labor and waste of capital consequent upon disease and pauperism, were matters of social economy of which the average rate-payer took no account. He would endure poor-rates, and tax himself for beer, tobacco, and luxuries, but would not willingly submit to taxation for preventive sanitary measures. But our municipal system and local government are the very essence of our freedom. With all its littleness and serious defects, it would be as useless as undesirable to advocate centralization, which practically meant red tape and bureaucracy. But there should be some power of appeal, some authority for regulating local authorities and parish cliques—an authority intermediate between the parish and the imperial department. Such a body was obviously the long-promised county board, which, being local and representative, would command respect and supply the constitutional machinery for regulating the vagaries of ignorant or interested Bumbledom. Having pointed out the ease with which jerry-builders could drive the proverbial coach and four through every act of Parliament bearing on this subject, the disinclination of the Local Government Board to assist local authorities to carry out their voluminous regulations, and the lack of power to require certificates of the sanitary condition of new houses before occupation, and want of control over additions and alterations of new or old buildings—an omission which might render all previous supervision nugatory—he continued: But, after all was said about legislation, local bodies, and officials, by far the greatest impediment to sanitary progress was to be found in ignorance and self-interest. They had much more to hope from education than legislation or officialism. The principles of sanitation were a vital subject, which should be taught in board schools, grammar schools, and colleges.

Neither public officers, local authorities, nor Parliament could accomplish reforms which should arise in ourselves. The efforts of the sanitary engineer, of the medical officer, of the sanitary inspector, would miss their mark, unless assisted by an intelligent appreciation of sanitary principles by the population at large.

SANITARY REFORM AND VOLUNTARY EFFORT.

Mr. Fred. Scott read a paper on this subject. He alluded to the difficulty of arousing public interest in any question in England, and urged that, inasmuch as the legislature and municipal authorities were never in advance of public opinion, it was of vital importance to possess an efficient means of educating public opinion in sanitary matters. It was seen that not even the proximity of real danger, as in the case of cholera, was sufficient to spur on the authorities to make ready for the threatened visitation. The issue of a handbill or poster was the extent of the effort made by a few local boards, whilst nothing at all was done by the great majority; and even where instructions had been given, the authorities, in many cases, failed to set a good example by the more frequent removal of filth from the neighborhood of dwellings. The almost total absence of organization for the prompt provision of hospital accommodation was a forcible illustration of the fatal policy of procrastination of most authorities. The practical suggestion of the paper was the extensive increase of voluntary effort in the promotion of sanitary reform, and this it proposed to accomplish:

1. By the union of all existing sanitary agencies for propagandist purposes, each society retaining its autonomy.

2. The co-operation of the Church in sanitary reform work.

The formation of a powerful league, with a central office in London, charged with the duty of sending out lecturers and others to help in organizing new societies and to keep alive local interest in them, and to bring the combined influence of all branches to bear in obtaining improved legislation, or the due execution of neglected laws, seemed a necessary first step.

The second proposal would, if carried out, provide a network of organization for sanitary improvement all over the country. It was not proposed to form a new society in connection with the Church. The proposed work might very appropriately be grafted on to the Church of England Temperance Society, which body had, almost from its outset, recognized as within its scope the *removal of the causes of intemperance*, in which were included bad houses, bad water, bad sanitary arrangements, and the absence of open spaces and other means of healthy recreation. The promotion of sanitary reform would not only be an aid to the cause of temperance, but facilitate the spiritual ministrations of the Church; and as the Temperance Society had already twice changed its name, it might with advantage once more alter it to the Church of England Temperance and Sanitary Reform Society. The advantage to the society itself would undoubtedly be great; for, as its constitution permitted membership even to non-abstainers who were "willing to promote temperance and aid in removing the causes of intemperance," it was certain the sanitary reform branch would attract many new adherents to the standard of the society, whilst the interests of public health would derive enormous help, owing to the great moral influence of the clergy and the numerous agencies in connection with parochial organization available for spreading a knowledge of the laws of health and leading persons addicted to unsanitary habits to improve their ways, such as ladies' district visiting societies, sick poor nursing agencies, mothers' meetings, clothing clubs, etc.

On Thursday a paper on "Ambulance Work" was read by Mr. J. H. Buckley, of the Leicester Ambulance Corps, describing the organization and work of that body.

SANITARY HOUSE MANAGEMENT.

A paper, full of practical hints on this subject, was read by the Countess de Viesca, of which the following is a short abstract:

The skill that designs and carries out great sanitary schemes of drainage, town improvement, or healthy house-building, is able to go no farther than to complete these schemes and have

them in good working order; their practical success is dependent on the good or bad use which is made of the facilities that engineering or architectural skill has given. It is here that the ladies' functions come in. It is the servants of a home whose properly directed work has to keep it clean and sweet. It is the lady of the house who only can regulate that labor, and, by adding to it her own intelligent supervision, can make it effective for cleanliness, and for the health to which that cleanliness is the first and greatest step. The writer is not an English woman; and having lived in Spain and France, and managed her household both in Spain and England, she is able to appreciate the advantages which the English attention to sanitary matters gives to residents here. She has long lived in England, and rejoiced in the opportunities given there for those who *will* be and live clean; and yet in England she has seen dirtier houses and smelt worse smells than either in France or Spain, arising only from laziness of servants and want of supervision by the mistress. The wants of proper drains, sinks, and closets is a serious evil; but drains, sinks, and closets neglected and uncared for may, and do, produce far worse evils than their entire absence; and nothing less than constant supervision on the part of the mistress of the house will secure that attention to the petty and unsavory details of keeping it clean in all its parts which is essential to health. The English "spring cleaning" is a rather significant expression, and the institution itself, however praiseworthy, gives an insight into the reason of many stuffy rooms and dirty houses. It means, in fact, that *only* at that solemn function are the rites of a proper "turn out" ever performed. A healthy house should never need "cleaning," for it should be *kept* clean by daily and constant attention. No dust or dirt that can be removed by brush or duster should remain in a living room over a day, special care being given to all the nooks and corners that so quickly harbor "fluff" and dust. The mistress should not be above using brush or duster herself, and showing her maids how and where to look for and get rid of dust and dirt. They will learn much more quickly and readily by her example than from any other instruction, and if she has china, or other fragile ornaments, she will avoid vexatious breakage by showing her servants how to properly clean them.

Such things are new to most young servants, and they break more from ignorant handling than from wilful carlessness. The kitchen is the place which needs the most constant care to keep clean and free from smells. Here perfect order is a great help to cleanliness. All pans, dishes, etc., used in cooking should have each its own hook or place on the shelves, and should be replaced there as soon as it is cleaned. All refuse of any kind that can decay and give off smells, such as bacon parings, cuttings of vegetables, potato peelings, etc., should not be thrown in the dust-bin, but burnt in the kitchen fire; this gets rid of them in the safest and easiest way; the proper time to burn them is directly cooking is over, when the fire is bright and hot; then they are quickly consumed, and serve to partly keep down the heat of the fire, then no longer wanted. If care is taken in this way, never to throw anything but dry ashes into the dust-bin, and to burn everything that would decompose, no fear need be felt of smells from that quarter, and there is less to be got rid of by the scavenger. It should be a rule that nothing likely to choke a trap should be put into the sink—such as hair, or scraps of cloth or paper. Water in which green vegetables have been boiled should never be poured down the house-sink, but always carried to the yard-sink, and disinfectants should be freely sprinkled daily. What the writer wishes to impress on ladies who have the management of a house is, that all these matters are peculiarly within their province, and should not be entirely left to servants. It is the lady's business to see that the work is properly done by her servants—not to do it herself, except in the way of instruction—and if some of the duties are not altogether pleasant, yet let her remember that, by seeing them properly done, she is helping, as only she can help, to preserve the blessing of a clean, sweet house to her family, and in that way securing their health, so far as lies in her power, and keeping the doctor out of the house. The writer trusts that she has shown that the part which ladies can take in the sanitary management of houses is no small one, and her own experience enables her to assure them that it is one which no lady need be ashamed of or unwilling to take. The complaint, so often made, of dirty, untidy, and unskilful servants, would be seldom heard were ladies to take personal interest in training those

who come to them. A good mistress turns out good servants, and may in that way influence the future comfort of many a working-man's home.

SMOKE ABATEMENT.

Mr. W. R. E. Coles read a paper on the subject of smoke abatement, and in the course of his treatise remarked that the assertion that smoke in the air acted as an antiseptic was absolutely baseless and foolish; present knowledge proving that it would be impossible to destroy the germs of disease that floated in the air without making an atmosphere in which it would be almost impossible for any human beings to exist. He observed that a considerable abatement of smoke had taken place owing to the introduction of gas stoves, which were largely in use throughout the kingdom, and it was highly necessary that smoke in towns should be prevented by the action of an enlightened public opinion and the restraining power of the law. He believed the advantages associated with smoke prevention were only to be obtained by certain sacrifices, and he equally believed that those sacrifices would in the main be trifling compared with the immense gain that would result.

The President of the Section, Mr. Percival Gordon Smith, F.R.I.B.A., observed that he was glad to find that the reader of the paper had referred to the domestic chimney, because he had often thought that some blame was due to them as well as to the chimneys of manufacturers. A great many people were not aware that the size of the domestic chimney was obliged to be 14 inches by 9 inches. There was another act of Parliament —the Chimney-Sweepers' Act—which said that every chimney from a habitable room should be at least 14 inches by 9 inches, and, curiously enough, the police were the parties empowered to see that this was carried out. He believed the police knew nothing about this part of their duty.

Mr. Ernest Hart (London) said that all physiologists agreed that smoke was an evil by striking down the rays of the sun and destroying its influence; and when conifers died, flowers could not be made to grow, and wax could not be bleached, they could easily understand how the inhabitants of towns and

cities must have their health affected. When he was a boy, roses could be grown at Kensington Gardens; but roses could not be made to grow now, and the last conifer, he believed, died last year, and the last wax-bleaching factory in the vicinity of London disappeared from Shepherd's Bush last year—all pointing to the lowering of vitality by smoke. With regard to the abatement of smoke a great deal depended upon voluntary co-operation of individuals, and the willingness of magistrates to enforce the law as it existed at present. It was much the habit of taking care that legislation should not outstrip public opinion, and with that view the enforcement of penalties for non-observance of the law was placed in the hands of gentlemen supposed to represent public opinion, but in manufacturing towns it was often the case that the producers of smoke themselves were empowered to interpret public opinion to be in favor of a continual production of smoke. The smoke inspectors were under the control of the magistrates, and, as the magistrates were probably the leading manufacturers, it was difficult to see how they erred. Parliamentary smoke was defined as issuing from a chimney so densely that they could not see the sky through it; but a man saw more or less acutely according to the impressions which were passing through his brains, and a test of that was that a good many people could see the sky when everything was black and smoky; and, unless they made the laws more stringent, their only power was the motor power of public opinion, and he thought that they were disposed to rely upon it.

Professor de Chaumont said he could corroborate what had been said regarding the non-antiseptic qualities of smoke in the atmosphere. Experiments which he had made, in conjunction with Professor Macdonald, had revealed to him that the amount of acid necessary in the air to kill bacteria would have to be such that no human being could possibly live in it, so that would explode the old-fashioned idea of the antiseptic qualities of smoke. The counter-effects of smoke were such that a strong indictment could be made against the presence of smoke in the atmosphere. With regard to the changes made in the methods of domestic consumption of fuel, one of the great difficulties in the universal adoption of gas was its high price. He knew gas companies which were paying the

maximum dividend, and then putting to the reserve fund a larger sum than they had paid in dividends. He did not think that ought to be allowed. The legislature stepped in and put a limit to the amount of dividend, and he thought it ought to be clearly laid down that gas companies, after getting the maximum amount of dividend, ought to apply the surplus funds in lowering the price of the commodity they supplied. The provision of fuel-gas was a great desirability, because it could be obtained more cheaply than the incandescent gas. For heating purposes they did not require illuminating gas, but the maximum of heat, with no deposit, which they could not have with incandescent gas. If gas companies could be induced to supply such gas, he believed it could be made at one shilling per thousand feet, or even lower than that. Some of these improvements would, no doubt, bring the use of gas within the reach of all, and if they could add to that the introduction of domestic electric lighting, they would have arrived at an ideal state of perfection.

PLUMBING AND PLUMBERS' WORK.

Mr. Fred. Scott (Manchester) read a paper on "Plumbing and Plumbers' Work," in which he said that a movement had recently been inaugurated by the Worshipful Plumbers' Company, of London, to raise the status of plumbing as a craft, and thus promote, in the interests of the public, an improvement in a class of work upon which health so largely depended. Most householders could testify, from sad experience, to the fact that inferior or "scamped" plumbers' work prevailed to a very considerable extent. A series of illustrated articles on "Defective Plumbing," by Dr. Francis Vacher, the medical officer of health for Birkenhead, was now appearing in the *Health Journal*, of Manchester. There were cases of the most atrocious character, vouched for by medical officers of health and others as coming under their notice almost daily. In October, 1884, the Plumbers' Company held a conference at the Health Exhibition, and the decisions then arrived at were, shortly stated, as follows: That the evils now experienced from bad plumbing were substantially traceable to four causes. 1. The identity of the plumbers' craft being to a great extent

lost or obscured through the merging or the amalgamation of the various branches of the building trade. 2. The system of apprenticing lads for a term of years to learn the trade had fallen off to a great extent, and, in consequence, there was an excessive influx of men who were not properly qualified plumbers. 3. That while there had been considerable changes in the character of some of the materials used in plumbing work, the standard quality of such materials had not been determined by custom or the general assent of the trade, and there was much uncertainty as to the selection of material, and much that was unsuitable was used. 4. The public regulations which dealt with certain details of the construction of new houses, and their connection with the public sewers, did not sufficiently recognize the importance of securing the efficiency of the plumbers' work done in those houses. With a view to remedying this state of things, the Plumbers' Company had found a representative committee of practical men and others, who, from their known sympathy with the object in view and their connection with the legislature or municipal bodies, could help forward the work of reform. Only one meeting of this council had yet been held, when resolutions were adopted asking the Plumbers' Company to establish a system of registration of plumbers of the city of London and within a circuit of seven miles thereof, the register to be open to the admission of those who could satisfy the court of their qualification by either of the following means: 1. Evidence of present status and experience in the trade. 2. Examination by board of examiners, composed largely of practical plumbers, appointed for the purpose by the court. 3. Production of certificate of competency granted by the Plumbers' Company and the City Guilds of London Institute. The court should reserve the right to remove names from the register in cases of proved misrepresentation or other gross misconduct injurious to the trade and the public. Plumbers admitted to the register should be entitled to use the letters R.P. (registered plumber) after their names. The consideration of the organization of provincial boards of examiners of plumbing work and other business was postponed. The Manchester and Salford Sanitary Association, recognizing from the outset the great importance of the work undertaken by the

Plumbers' Company, arranged for co-operation with that body as its plans should be developed, and all now bade fair for at least one important provincial centre keeping abreast of London in this useful work.

FUNERAL REFORM.

The Rev. F. Lawrence, Vicar of Westow, York, the Honorary Secretary of the Church of England Funeral Reform Association, read a paper on the unsanitary evils arising from burial in imperishable coffins in insufficient earth. Deferred burial, he said, was an evil to the public health; but the greater evil consisted in the evasive and unnatural method of storing up human remains in every stage and condition of decay, destroying the soil, fouling the air, contaminating the water springs, and spreading the seeds of disease. No wonder that this accumulation in our midst of vast masses of human remains had suggested cremation; but three objections presented themselves. Cremation ignored the great fact that the earth was the most powerful disinfectant known; it necessitated a costly, and often perfunctory and ineffectual, post-mortem examination; and facilitated secret poisoning. The Church's "Order for the Burial of the Dead" suggested a method which avoided the evils now complained of, and satisfied the requirements of right feeling and sound science; being, in fact, another form of cremation—called by Liebig eremacausis—slow cremation, the earth being in this case the natural crematory. The body was placed in a coffin constructed not with a view to endurance, but to its speedy perishability, and buried three or four feet deep in its own grave in well-drained, dry, and porous soil, and there underwent not merely decay, but a process of transformation, until at the end of seven or eight years it had literally risen again in the form of carbonic acid and ammonia, which had mingled with the air and nourished plants, leaving behind nothing but organic matter.

In the discussion on this paper, Professor Symonds and one or two other speakers advocated cremation, but the majority were in favor of Mr. Lawrence's views.

The other papers read at the Congress were not of a character likely to be of general interest, or would not bear the abbreviation necessary to include them in this report.

THE HYGIENE AND MOVEMENTS OF THE POPULATION IN BUENOS AYRES AND SOME OF THE OTHER SOUTH AMERICAN STATES.*

TAKING the meridian of Washington for the base, and the equator for the perpendicular, South America will form nearly a right-angled triangle, its greatest breadth being from Cape Blanco, in the north of Peru, to Cape St. Roque, in the Atlantic, about four degrees south of the equator.

Africa, like its western neighbor, is similarly shaped, and, like it, lies almost entirely within the torrid zone. The 112th meridian, east from Washington, will form the base, and the 30th parallel, north, the perpendicular, of the triangle; the widest part of the continent being from Cape de Verde, in the Soudan, to Cape Guárdafui, at the entrance to the Gulf of Aden.

In their relation to climate and the relative extent of land and water, both these continents are situated directly the reverse of North America, whose greatest breadth is from Vancouver's Island to Newfoundland, about the 50th degree north latitude, the greater part of the continent being within the temperate zone.

But South America, unlike Africa, has a rich soil, well watered, producing a luxuriant vegetation, abounding in magnificent forests, a climate comparatively temperate, because tempered by the moisture of the atmosphere, and the cool

* *Annuaire Statistique de la Province de Buenos-Ayres*—République Argentine—Publié sous la direction du DR. EMILIO R. CONI, directeur du Bureau de Statistique Générale. Deuxième Année, 1882, Buenos-Ayres, 1883. Troisième Année, 1883. Buenos-Ayres, 1885.

Revista Médico-Quirurgica, publicacion quincenal, organo de los intereses médicos Argentinos; Redactores: Dr. Pedro F. Roberts y Dr. Lucio Melendez; Director y Redactor en gefe, Dr. Emilio R. Coni; Miembro honorario, etc., Miembro corresponsal de varias Academias y Sociedades Médicas de Europa y América. Buenos-Ayres, 1875 to 1885.

Revista Argentina de Ciencias Médicas, Director Dr. Don Pedro Laglayze; Catedratico sustituto de oftalmologia, etc. Buenos-Ayres, 1885.

breezes from the snow-capped Andes on the one side and the Atlantic on the other.

THE SANITARIAN, in preceding volumes, has treated of the climatology and other conditions relating to public health in Buenos Ayres, Bahia, Rio de Janeiro, and other cities of the southern continent. It is now proposed to give a description of the sanitary condition of the Argentine Republic, and particularly of the city and province of Buenos Ayres, because the commercial relations of this part of the continent with the United States, and, indeed, with every part of the world, is extensive and important. Much of the information here given is taken from the annual reports, and from the Revista Médico-Quirurgica.

Chili, the Argentine Republic, Paraguay, and Uruguay are the only States of South America within the temperate zone, except the dreary wastes of Patagonia and a small part of Brazil.

The Argentine Republic is the largest of the South American States except Brazil. It has an area of 820,000 square miles, a territory equal to that part of the United States east of the Mississippi River, and about 3,000,000 of inhabitants. It lies almost entirely within the south temperate zone, a small strip only extending above the Tropic of Capricorn.

The Andes form the western boundary, and separate it from Chili. On the Argentine side the mountains slope gently to the plains, and afford a great variety of climate, soil, and productions. The Rio de la Plata and its numerous tributaries water the extensive, treeless plains which extend from the foot of the mountains to tide-water. Over these plains roam immense herds of cattle and wild horses. They resemble, in soil and adaptability for cultivation, the plains of Europe and the prairies of North America. The raising of ostriches and the exportation of ostrich feathers is, in some parts, a remunerative branch of industry. In extent of territory, topography, fertility of soil, and mildness and variability of climate, the country is exceptionally favored. The evenness of much of its surface facilitates the construction of railroads and other means of intercommunication, so necessary for the development of great industrial enterprises. Its vast rivers and extensive sea-coast, forming a great part of its boundary, will enable it to extend its commerce, foreign and inland, indefinitely, as its population increases and its productions are multiplied.

The unfavorable conditions are: the sudden changes of temperature, the irregularity of the rain-fall, extensive marshes on a part of the Atlantic coast, want of trees and forests, and the lightness of the soil in the southern part. These will retard the development of some parts of the country, but cannot wholly prevent it. Some of these conditions can be remedied in time. Extending agriculture and planting trees will modify the climate and influence the rain-fall, and the government has already taken steps to drain the marsh land on the coast. The light soil is the only condition not susceptible of improvement, because it will not sustain a growth of heavy timber nor bear deep ploughing.

Buenos Ayres, one of the fourteen provinces that form the Argentine Republic, occupies the eastern and middle part of the State. It is by far the most important part of the republic, both in wealth and population, and its situation gives it advantages unsurpassed anywhere, for about two-thirds of its boundary is formed by the rivers Parana and La Plata and the Atlantic. The city of Buenos Ayres, formerly the capital of the province of the same name, has recently been ceded to the republic, and the capital of the province has been located at La Plata, about forty miles down the river La Plata, which has here a width of about one hundred and seventy miles, its whole length being only two hundred miles.

The volumes cited form the second and third annual reports of statistics for the years 1882 and 1883, making together nearly nine hundred pages of large quarto, elegantly printed on fine heavy paper, profusely illustrated with colored maps giving valuable details regarding the orography, hydrography, mountains, rivers, and the elevations and depressions of surface; their relations to climate and water-supply, temperature, relative humidity of atmosphere, and the influence of these on public health, railroad stations, telegraph routes, public roads, boundaries of districts, cities, towns, etc.

According to the *Bulletin Mensuel de Démographie*, the population of the city of Buenos Ayres is 375,000.* The pop-

* *Bulletin Mensuel de Démographie* de la ville de Buenos-Ayres—Capitale de la République Argentine, Publié par le Docteur Emile R. Coni, Directeur en chef de la *Revista Médico-Quirurgica*, etc. Buenos-Ayres, Juin 1885. It may be remarked that this *Bulletin*, as well as the *Annuaire Statistique*, is published in French for foreign distribution.

ulation of the city is not included in that of the province, although situated within its limits, as the population of Washington is not included in that of Maryland. Independent of this, the population of the province is 612,239; included, it would be only twelve thousand under a million.

The mildness of the climate and the moisture of the atmosphere are said to prevent the spread of epidemic diseases and favor their rapid extinction; and the sudden changes of temperature in some parts, far from proving injurious, give increased vigor both to men and animals, and enable them to endure labor and fatigue under all conditions of atmospheric changes.

The Meteorological Bureau, attached to the National Observatory at Cordova, has furnished tables giving the temperature, rain-fall, and other valuable information, to illustrate the climatology of the country. The mean temperature of the province for a series of years was 16° Centigrade, or nearly 61° Fahrenheit. This central bureau was established in 1872, and has done much toward increasing the knowledge of the climatology of the country, and the executive has commenced the formation of branches in different parts of the country. As these will be in communication with the central station, the annual reports can, in the future, be made more complete and valuable.

In 1881, the population of the province was 526,581, of whom 133,099 were foreign-born. The whole population formed 87,560 families, of which 30,078 lived in cities and towns, and 57,482 in the rural districts. There were 34,212 houses in the towns, and 71,726 in the country, giving about 5 inhabitants to each house.

In 1882, the population had increased to 577,230, and in 1883 to 612,239. In this year the births were estimated at 25,905, and the deaths were 10,894, giving an increase of 15,009 for the year, and the permanent immigration for the year was 20,000, showing a steady increase of population.

Of the 133,099 foreign inhabitants, 57,128 were Italians; 33,692 Spaniards; 20,728 French; 9,089 English; 1,479 Germans; 1,696 Swiss; and 9,277 of other nationalities.

The following summary will be of interest to those who wish to compare the relative density of the population in different countries in Europe and America. The number of in-

habitants given is that occupying a square kilomètre, which is about $\frac{3}{10}$ of a square mile.

In Europe, Belgium is the most densely populated country, and in America, Chili. The mean density of the population by countries is 32 inhabitants to the square kilomètre in Europe. Doubtless the limited extent of territory in Chili gives it the advantage of a more dense population, because there is little waste territory.

Belgium	187	Portugal	49
Holland	125	Spain	32
Great Britain	112	Turkey in Europe	26
Italy	96	Sweden	10
Germany	84	Russia	7
France	71	Chili	6.8
Switzerland	69	United States	6.6
Austro-Hungary	61	*Buenos Ayres*	1.7
Denmark	51	Argentine Republic	1.2

The north of the province is the most thickly settled, the number being 5.57 to the kilomètre.

The relative proportion of natives to foreigners is 75% natives, 5% from other South American States, and 20% Europeans.

The demographic relations are instructive and interesting. Of the whole population the proportion of males to females is 563 to 437, while in the native population there are 509 males to 491 females, and in the foreign 725 males to 275 females. Thus, among the immigrants the males are much in excess of the females, being as 29 to 11.

In every 1,000 natives 514.9 are under 14 years.
" " " 426.3 " from 14 to 50 years.
" " " 58.8 " over 50 years.
In every 1,000 foreign-born 91.1 are under 14 years.
" " " 808.0 " from 14 to 50 years.
" " " 100.9 " over 50 years.

The proportion of children is unusually great in the native population, because nearly all the immigrants are adults, and, necessarily, all born of foreign parents are natives. It will be observed that the number of foreigners in every 1,000 over 50 years is nearly double that of the natives.

The mortality for 1883 was 18 per 1,000, a rate which shows the healthiness of the climate and the country generally. The greatest number of deaths occurs in January and May: January representing midsummer, which is especially fatal to children, who die from gastro-intestinal diseases during the warm months. The deaths under one year are 30.9% of the whole; between 1 year and 8 they are 19.3%; from 8 to 15 years, 4.6%; from 15 to 25 they are 16.5%; from 25 to 35—8.8%; from 35 to 45—7.9%; from 45 to 60—8.3%; and over 60 years, 9.2% of the whole.

The most fatal diseases are phthisis pulmonalis, pneumonia, bronchitis, rheumatism, organic diseases of the heart, variola, diphtheria, typhoid fever, tetanos in children, measles, scarlatina, and the various forms of gastro-intestinal affections. In 1883 variola was unusually severe, causing 1,289 deaths; but generally phthisis is the most fatal, having, during the years 1879 to 1883, caused 9.1% of all the deaths; still, this is less than the mortality from the same disease in Europe. Tetanos ranks next, having caused 7.8% of all the deaths. Variola, during the year 1883, caused 1,289 deaths, which was nearly 24% of the whole number for the year; pneumonia, 757, or 14%; meningitis, 327, or 6%, and diseases of the heart, 315, or more than 5½%. Other diseases were, typhoid fever, 252; diphtheria, 241; and bronchitis, 193, in a total of 5,386. Cancer, too, caused the enormous proportion of 175 deaths.

In 1882 there were opened 75 new schools, and 45 new buildings were erected for educational purposes. In 1883 there were added 100 new schools for public instruction. In 1882, there were 162 private schools and 221 teachers; in 1883, they numbered 170, with 301 teachers. The rural districts are very sparsely settled, for in 17 of the 80 districts in the province there is no doctor, and the sick, especially children, receive only the most primitive kind of treatment. So, in some districts, schools are few, and at such distances that the rainy winter of 1883 is cited as a cause of decreased attendance. The prevalence of small-pox was another cause.

Colleges have been founded by the government, and many are under the direction of religious societies, devoted exclusively to that service. Two schools for instruction in the arts and sciences exist, one in charge of the government, and the

other under the direction of the Fathers Salaisiens. Besides these, there is a school of agriculture, and a school of veterinary medicine, at Santa Catalina.

There are about 33,000 volumes in the National Library, and 41 circulating libraries have about 42,000 volumes.

In 1881 there were 8,096 children without fathers, 4,663 without mothers, and 2,896 without father and mother. Thus, there were 15,655 orphans in the whole population: one half-orphan in every 41 inhabitants, and one deprived of both parents in every 181.

In the asylums there were 461 insane, or 1 for every 1,144 inhabitants; 606 deaf-mutes, 1 in every 868 persons; 378 blind, 1 in 1,393 individuals; 599 cretins, 1 in 879; 141 suffering with goitre, being 1 in 3,734, and 1,804 sick, 1 in every 291 inhabitants.

From 1869 to 1881 those afflicted with the diseases just named had decreased in the ratio of 144 to 84, a circumstance which is looked upon as very gratifying. It is also remarked that Norway, England, Denmark, Prussia, and Italy have a greater number each, of insane, than Buenos Ayres; Russia, England, and Norway, more cretins; Norway, England, Prussia, Italy, Denmark, and France more blind, but Buenos Ayres has more deaf-mutes in proportion than any of the countries named.

Much of the results here described has been accomplished by the indefatigable industry of Dr. Emilio R. Coni, who has been the Mentor of his own government at home, and its representative in all of the Sanitary Congresses in Europe or elsewhere during the last ten or more years.

T. P. CORBALLY.

COMPARATIVE LONGEVITY OF MEN AND WOMEN.

INTERESTING researches concerning the comparative longevity of men and women in Europe have recently been made by the Director of the Bureau of Statistics at Vienna. From these it appears that about a third more women than men reach advanced age. Women oftener lead quiet, regular lives.

They have fewer bad habits, are less exposed to strong passion and excitement. It appears from the gathered statistics of the world that women have a greater tenacity of life than men. Nature worships the female in all its varieties. Among insects, the male perishes at a relatively early period. In plants, the seminate blossoms die earliest, and are produced in the weaker limbs. Female quadrupeds have more endurance than males. In the human race, despite the intellectual and physical strength of man, the woman endures longest, and will bear pain to which the strongest man succumbs. Zymotic diseases are more fatal to males, and more male children die than females. Deverga asserts that the proportion dying suddenly is about 100 women to 780 men ; 1,080 men in the United States in 1870 committed suicide to 285 women. Intemperance, apoplexy, gout, hydrocephalus, affections of the heart or liver, scrofula, paralysis, are far more fatal to males than females.

Pulmonary consumption, on the other hand, is more deadly to the latter, which argues that we ought to give the girls of our families all the out-door exercise that they need. Females in cities are more prone to consumption than in the country. All old countries not disturbed by emigration have a majority of females in the population. In royal families the statistics show more daughters than sons. The Hebrew woman is exceptionally long-lived, while the colored man is exceptionally short-lived. Dr. Hough remarks that there are from two to six per cent. more males born than females, yet there is more than six per cent. excess of females in the living population. The rush and worry of the average business man in this country is apt to make him prematurely old, unless he takes judicious recreation. The females are to a great extent exempt from this overstraining about business cares, which may, in a degree, account for their superior vitality.—*The Indicator.*

DR. GEORGE M. STERNBERG, U. S. A., has been reappointed delegate from this country to the International Sanitary Conference, which reconvenes at Rome in December. He has also been recently elected honorary member of the Royal Academy of Medicine in Rome.

HYGIENE OF THE NERVOUS SYSTEM AND MIND.*

THE RELATION OF THE NERVOUS SYSTEM TO CHOLERA AND ITS PROPHYLAXIS AND NEUROTHERAPY.

By C. H. HUGHES, M.D.

A CENTURY ago Cullen made the observation that from all that he could discern of the movements of the human body in diseases they were so intimately associated with, and dependent upon, the nervous system that they might in a manner be called nervous.†

The proposition has been sustained by every step taken in the forward march of medicine from that day to this; for, notwithstanding the significant and valuable discoveries of spores, fungi, microbes, bacilli, and other microscopic revelations, and their relation to morbid states of the blood, it is not until the nervous system is morbidly touched, and yields in disordered action (psychic, trophic, motor, vaso-motor, or other parts of the sympathetic, especially in its ganglia), that the characteristic phenomena of distinctive disease appear. The intangible virus of zymotic fever, which "touches the life of all the blood corruptibly," is first revealed in the *malaise*, cephalalgia, jactitation, insomnia or somnolencia, and delirium of the higher psychical centres of the cerebrum. And so in other fevers, after the symptomatic revelations of a disturbed and struggling nervous system notify the physician that his aid is needed, the microscope, if he has time then to use it, may reveal the proximate cause of the morbid commotion to be, or to have been, micrococci or filaria; but, until the assaulted ner-

* Read by title before the American Public Health Association, St. Louis, Mo., October 17, 1884.

† "Quantum ego quidem video motus morbosi fere omnes a motibus in systemate nervorum ita pendent, ut morbi fere omnis quodam-modo Nervosi dici queant." —Cul's Nos., b. II., p. 181, Edin., Ed. 1780.

vous system succumbs, we know nothing of the mischief brewing or the danger threatened, and the specific microbe sustains the same relation to the resultant phenomena that the draught of sudden exposure to change of temperature does to the vaso-motor paralysis and resultant mucous and vascular congestion phenomena of a common cold or its graver results in localized inflammation. Bacilli are not disease, but only potent causes, just as stone in the bladder, and sanguineous, fibrinous, or serous exudates are consequences, of morbid systemic action.

Malaria, of which we know so much and yet so little, reveals itself in chills and fever, both nervous phenomena, and in congestions, and delirium, and coma, which, but for the yielding of the vaso-motor nervous system and the psycho-motor area of the brain, could not occur; and, when the final ending of all physical function is foretold in the graver blood impoisonments of yellow and other fevers, the last expiring movement is in the nervous system, in those "idle comments of the brain which foretell the ending of mortality." This is true of the rigor mortis of sudden death and the last comatose symptom of cholera collapse. We have seen, in the progress of medical observation and research, many obscure diseases, as pathology has grown clearer, assigned to their proper place in the nervous system, from exophthalmic goitre to eczema, and from cholera to dyspepsia, notwithstanding that, in connection with the contagion and spread of cholera Asiatica, a contagium microbe (thanks to the labors and noble heroism of Koch) is proven in the comma-bacillus as the essential causative or resultant excitant and propagative factor. Yet cholera is essentially a disease of the nervous system in its symptomatic display, especially beyond the bowels.

The phenomena of the dread diseases which demand our attention are essentially nervous—the paralyzed vaso-motor control, which admits of the fatal aqueous exudations which permit the exsanguined and shrunken features and the fatal exhaustion; the sudden paralysis of appropriating power of the centres presiding over nutrition; the complete exhaustion of the trophic nervous system, which makes the administration of medicine in certain fatally predestined cases look like a solemn mockery; the pinched contracted visage, and the pain-

ful but finally painless cramps, and exhausted power of inhibition which sooner or later appears, all tell us how essentially nervous are the phenomena of this pestilence when once its hold is secure upon its victim, and suggests the importance of a well-sustained, vigorous, tranquil, and resisting nervous system in warding off its destructive attacks.

Though this pestilence no longer walketh in darkness, and though it wasteth less at noonday than in the distant past, its sad work still goes on under the glare of the brightest light of science; but there are hygienic methods to-day which diminish susceptibility to contagion by imparting public confidence, reducing mental demoralization and panic, and maintaining the general health of communities up to a higher standard. Though we by the light of science have probably found the cholera bacillus (the bacillus both of cholera Asiatica and of cholera nostras perhaps), we cannot yet entirely by power of science keep this potent living infinitesimal from evil; yet we can resist and circumvent its power, not alone by clean streets and dwelling-places, sunlight into the dark places, and disinfection and pure air where dirt and filth abound, but by clean and strong bodies, and by well-sustained, well-rested, invigorated and tranquillized nervous systems, built up in the power of resistance to the very maximum of physiological strength, not stimulated spasmodically by sudden fright after the pestilence has come, but trained up in advance by adequate but temperate nourishment; by ample rest of brain for the fullest possible recuperation each night of the day's wasted power; by making cities profoundly quiet in time of the pestilence, interdicting the needless noises, both day and night, which keep the cells of the brain and nervous system agitated and restless when they might be restful and in condition of repair for more work; and by a trained abeyance of the passions, the abandonment of exhaustive vices which undermine the nervous system and fit it to succumb to light assaults of disease.

To this end, in anticipation of an invasion of cholera here next year, the prudent will finish up, before the epidemic comes, present business enterprises which promise unusual mental strain, worry, or other tax on their powers; and permit a little of that reserve nerve-force to accumulate which hitherto, like an improvident man with his bank account, they

have been in the habit of expending as fast as it has accrued. Cholera is not in strictest sense a filth disease, at least in this country, though filth, by contaminating the atmosphere, impoverishing the blood, and impairing the nervous system, furnishes favorable conditions for its taking hold of the organism. On the contrary, putrefaction bacteria, as Koch asserts, destroy the comma-bacilli or arrest their multiplication. Alcoholic stimulation, at least to dissipation so-called, must be abandoned, the physiological tone of the vaso-motor system maintained, and the perfect stability of the higher cerebral centres —the psycho-motor and psychical—must be permitted to become re-established up to the point of their highest resisting power. Habitual alcoholization is a paralysant of the vaso-motor nervous system, as well as of the cortex of the brain, beyond all doubt, notwithstanding it acts as a temporary excitant, and momentarily stimulates latent power into increased activity. The excessive habitual use of stimulants like alcohol excites the heart's activity; exhausts the tonicity of the brain by causing it to expend its latent reserve power daily, and leaves its vessels dilated and its substance oppressed, the cerebro-spinal fluid crowded out of the perivascular spaces—and the brain is prepared then for apoplexia and coma. Tobacco, too, is a vaso-motor paralysant and motor-depressant, and weakener of vital power in those in whom tolerance has not been well established, and had better be used with moderation or abstained from.

To the end of proper prophylaxis, in regard to the nervous system, the hours of rest and labor should be regulated by municipal authority, that overtaxed human beings, especially among the poor, should not be made ready subjects for attack and almost certain victims to the fatality of cholera. Night-work should be discountenanced so far as practicable, and prolonged hours of labor without adequate rest following should, when practicable, be prohibited.

The schools should be looked after—tasks should be lightened and invigorating relaxation lengthened both for teacher and pupil, and more daylight and pure air let into the school-room; fewer hours of study should be required; overcrowded rooms should not be tolerated.

Those who hold people to service should see that they do

not engage in dissipating and exhausting pleasures during hours which should be devoted to sleep, and should enjoin staying at home and resting instead of wasting their nervous powers by frolicking till midnight, retiring to be awakened unrefreshed for the morning's work. Cholera in the kitchen imperils the health of the parlor, and the health of the rooms up-stairs is concerned in the welfare of the occupants of the laundry. Saloons should be closed at an early night season in times of epidemic, and men before they get dead-drunk in them should be taken home and put to bed by the police.

All causes of public or indirect depression of the nervous system should, in times of this epidemic, be avoided—long and exhaustive funeral services, especially in crowded and illy ventilated rooms, tiresome and ostentatious funeral processions, cars and rooms vitiated by tobacco-smoke and depressing human exhalations.

Men may deny that nature's God commanded the Sabbath day for rest, but physicians know that imperious nature demands it, if longevity of human life would be reached. The law of Moses commanding a respite from customary labor one day in seven was founded in physiological wisdom, if not in inspiration, and for this reason physicians should demand that the sounds of busy industry should cease one day in seven ; that the ceaseless bustle and din of business, which so tries the nervous system during the week, shall cease for one day of recuperative rest to brain and mind; all needless noises that harshly grate upon the ear and rob tired nature of its just repose, should be suppressed in order that enough of sleep and rest, "sore labor's bath," "tired nature's second course," may come to the people of the heart of the city to "knit up the week's ravelled sleeve of care." There is too much unnecessary noise, even on ordinary business days, and too much noise allowed in the night, and altogether too much on Sunday, for the highest health of the people of our great American cities.

The wealthy suburban resident does not suffer so much from this cause of nerve disturbance as the working-man, and subordinate business-man who lives down-town ; but the needless wear and tear of brain and nerve from unnecessary and preventable city noises, if prevented, would add very materially to the healthful endurance of the people in time of cholera, and

at all times prolonging life and averting insanity and premature failures of the nervous system in other directions. To be well repaired, man, like any other machine, must rest, and rest of brain and nerve is disturbed through the channels and centres of audition as well as through those of motion.

The prayer of conservative physiology is for rest, for the salvation of the resisting power of the nervous system to devastating pestilence, and the power of resisting disease in general is in adequate rest of the organisms which is a condition of its repair and power.

The cause of much of the premature decrepitude and nerve degeneracy and break-down is in the many inventions man has devised whereby he robs himself of timely rest. The morning newspaper, often read through before breakfast; the telephone in his house, to call him at any and all times aside from his repose; the electric light, to keep his brain unduly stimulated through the retinæ; the railroad and the sleeping-coach, which may keep him continuously on the rail (if he chooses to so travel) for many weeks without rest from the noisome and exhaustive cerebro-spinal concussions of this mode of travel; hasty meals, and telegrams, and business, and nightmare sleep, all commingled, wither and wreck lives innumerable, which, under wiser management, might end differently; and the needless noises of the city—the bells, and whistles, howling hucksters, noisy street-cars, yelling hoodlums that make night hideous with their howls—hasten the premature endings of useful lives; and when, superadded to all this unphysiological strain, we have the assault of a pestilence that poisons, like cholera, how much exemption can such overwrought organisms expect? How much of resisting immunity can such overstrained and exhausted nerve-force oppose to the invading foe?

If the epidemic comes, as it almost surely will next summer or fall, there should be a common understanding among physicians to demand as much rest as practicable for the people, and by comity among themselves they should lighten each other's labors, and no one should work continuously night and day.

It is not long after an epidemic comes before the long-watching nurses and the tired, overtaxed doctors become its victims.

The lesson a pestilence teaches is not only cleanliness, but temperance, and restful, resisting vigor for the nervous system, and the conservation of its powers, maintaining the functions of the body in the presence of a blood-depressing, assaulting enemy. With the human organization in a long contest the blood is the life, but if the nervous system have secured to itself, by ample rest, frugality, and economy of expenditure, and by freedom from overstrain and vicious indulgence have established the habit of claiming and securing to recuperative use its own elements from the blood, it will be long in yielding, and longer still in perishing, under the assaults of disease.

It is this trained resistance of the nervous system by which it is taught physiologically, pending a successfully resisted attack, to claim its own nutrition, even while the blood is depressed by the presence of a pestilencal virus, which, in my opinion, constitutes immunity from recurring attacks; the comma-bacillus is destructible, too, in strong healthy gastric juice, as Koch has shown in animals, and Klein has demonstrated with his own stomach by swallowing them; and it is through a vigorous well-poised nervous system that we may be assured of the destructive potency of the gastric digestive secretion. The inferior animals, too, whose nervous systems are unshattered by the vices and overstrain of civilization, are largely exempt from cholera.

In time of epidemic the illy-fed, unrested, poverty-stricken, or vice-broken succumb even more frequently than those whose ambition for wealth and schemes for success rob them of the full benefit of sleep and regular food and recuperating rest.

Many a man, well endowed and unweakened in his nervous centres, goes about unharmed with the same amount of malaria in his blood, probably, which causes another, less strongly fortified, to succumb to a fatal form of congestion.

All other things being equal, the tranquil-minded and restful and daily and adequately recuperated nervous systems of a community afford the best and longest immunity in time of pestilence. The unrested and unrestful, the weary and the heavy laden, the vice-broken and the unsteadily endowed nervous systems furnish the most and earliest victims.

Insomnia is a thief that robs the brain and nervous system

of power and circumvents recuperation—a factor in nervous break-down more potent than all others, yet it is preventable and curable by remediable measures, public and private.

There is, therefore, without dwelling more in detail, an obvious and important conservative hygiene for the nervous system in time of great epidemics, and the time for the beginning of preventive measures should be in advance of the actual presence of the morbid invader. That time is now, for, when the pestilence shall have come and gone, those who are fittest in the tone and resisting power of their nervous system to survive will live out the scourge. The weak and organically unprepared will succumb.

The practical deduction from the foregoing, to avert cholera from the human system, in addition to such measures as quarantine it from the country or chemically destroy the bacillus and prevent it from coming into contact with the organism at all, is to eat only such slightly irritating substances as will promote the gastric secretion, without inducing catarrh of the stomach, and keep such a supply of healthy gastric juice in the stomach as will destroy such comma-bacilli as may find lodgement there. Take the best possible care of the physiological vitality of the central nervous system by every known means of rest and repair. Maintain by normal nutrition and electrizations the necessary tone of the solar plexus and the perfect physiological integrity of the cerebro-spinal axis; keep away from the cholera-infected when the system is exhausted and the supply of gastric juice is likely to be scanty or weak in quality; cultivate and maintain a state of hopeful mental tranquillity by avoiding every source of mental overtax and unrest.

The successful prophylaxis of cholera consists of something more than quarantine or chemical disinfection. The chemistry of the nervous system itself, if we but invoke it, may give us aid. The cultivation of resisting nerve-force involved by healthy organisms is worthy of our consideration. A wise prophylaxis and therapeusis seems indicated in adequate rest of the nervous system; in galvanism, which maintains its tone; and static electricity, which promotes its vigor at the same time that it has the probable power to destroy bacilli; and in hot water, as near 150° F. as practicable, taken internally, which gives nerve-tone and dissipates congestion through its influ-

ence on the vaso-motor system; and in chloral, which gives strength through restorative rest, and which is also powerfully antiseptic.

The following brief epitome of the anatomical and physiological data of the subject may serve to show still more plainly how essential is the integrity of the nervous system, in its highest physiological power, to the prophylaxis and endurance of cholera. It is also a sufficient anatomical résumé for the subject which follows:

The local innervation of the stomach and intestines is carried on through interlacing nerve-fibres and ganglion cells embedded in submucous and muscular coats—Auerbach's plexus in the muscular, and Meissner's in the submucous, tissue. Descending from the medulla are the pneumogastrics, and from the solar plexus of the sympathetic comes gastric branches. The pneumogastrics from the medulla, and the gastric branches of the solar plexus, may be said to encompass the stomach.

Vaso-motor nerves branching through the splanchnic from the solar plexus accompany the gastric vessels. These nerves have connection with medullary centres, and pass through the cerebral peduncles and thalami optici to higher centres in the cerebrum.

The salivary and gastric secretions, as well as the movements of the stomach and bowels, are dependent upon nerve-influence and the regulation of inhibition and excitation. Gastric secretion is partly a local reflex act through peripheral stimulation from the interior of the stomach, through the nerve-branches which go to Auerbach's plexus embedded in the submucous tissue, but the amount and quality of this secretion will depend largely upon the integrity of the general ganglionic and whole nervous system, especially upon the tone of the solar plexus and the brain.

The gastric secretion may be inhibited or excited by a powerful mental impression; a painful emotion suppressing, and an agreeable one, as of the remembrance of a delicious dish, exciting it and the salivary secretion also.

A reflex from the gustatory nerves to the brain may pass to the stomach and excite it. Great fatigue, as well as great pain, suspends both gastric secretion and appetite.

During the week of the great St. Louis fire, in 1849, the

ravages of cholera, which up to that event had reached a mortality of over two hundred a day out of a population of fifty thousand, almost entirely ceased, so stimulating and invigorating was the excitement of that week to the brains and nervous systems of the people—the psychical exaltation inseparable from the sudden necessity thrown upon so many business men for repairing the sudden damage and re-establishing their suddenly interrupted business. Some of the germs, too, may have been destroyed by the great heat, but it was only the business part of the city that was destroyed, where but little cholera prevailed, except on the steamers. I was in the city at the time, and recollect this to have been the fact. And after a week had expired the pestilence raged as before, in all its resistless and relentless virulence.

"NO CHILDREN ALLOWED."—The "Solid Comfort" will answer for the occasion to designate an elegant apartment house opened about two years ago in a suburb of Boston. It was finished with all modern conveniences and inconveniences. There were electric bells in a row at the door, so that the afternoon caller could ring up nine different and peaceful maid-servants before getting into communication with the family she came to see; there were fire-escapes and telephones, and elevators and speaking-tubes, and, in all probability, safety-valves and submarine cables. But the crowning joy of all was the fact that no children were allowed within its walls. It was built for the accommodation of childless couples, and to ten childless couples were the suites let. How great was the quiet and calm of that sheltered retreat, until one ill-starred morning, when the cry of an infant shrilly and piteously broke the stillness! Horror and indignation on the part of nine guiltless couples! And yet, so weak is humanity, that before the end of the second year there were children in seven of the ten families! The childless young couples were childless no more; and when the owner of the building complained to his friends of the unfair treatment he had received at the hands of his tenants, they all laughed in his face, and advised him to let his apartments to bachelors.

RAILWAY SANITATION.

PENNSYLVANIA RAILROAD COMPANY.

PHILADELPHIA, September 25, 1885.

EDITOR SANITARIAN :

DEAR SIR—I have read with much interest your article in the September number of your magazine in reference to "Railway Sanitation."

This company has been enforcing a system of sanitation throughout its entirety since April 25th ult. (please note enclosed circular); and here in Philadelphia we have been having monthly sanitary inspections of all our property since July 1, 1884. We have abated many nuisances, and instituted sanitary reforms wherever same have been needed.

All our privy wells, some twenty-five or more, have been abandoned, and proper connections made with the public drainage.

From time to time such sanitary instructions as circumstances demanded have been issued. A more thorough and extended sanitary oversight of this company's property will in all probability be instituted in the near future.

Respectfully, SAMUEL W. LATTA,
Surgeon P. R. R. Co.

Circular in Regard to Disinfection.

In view of the possible appearance of cholera in this country, the attention of all employés is called to the following points in regard to disinfection, and general preventive measures against disease :

The most important means of preventing infectious disease is cleanliness—cleanliness not only of the body, but also of surroundings. No disinfectant can take its place. All shops, stations, and adjacent grounds, as well as the tracks between stations, should be kept scrupulously clean. Decaying animal or vegetable matter, so often the home of disease, should, where practicable, be burned. Privies should be scrubbed

with soap and water not less than once in two weeks. Drains and sewers should be flushed with fresh water as often as once a week, if the water-supply will admit. Passenger cars should be thoroughly ventilated, and the plush beaten frequently. The paint and glass should be washed at least once in two weeks. The closets and floors of passenger cars should be washed at least once a week with "P. R. R. Disinfectant," according to the directions given. Freight cars at stations should be cleaned before leaving the station, and, if the refuse taken from these cars cannot be satisfactorily disposed of otherwise, it must be burned.

Too great care cannot be exercised in keeping the water-supply used for drinking and household purposes free from contamination, impure water being one of the most effective means of generating and spreading disease. Privies and stables, and the outlets of drains and sewers, are frequently so located that the drainage therefrom finds its way readily into the water-supply. In some cases this is, without doubt, unavoidable, but where practicable the location should be such that this drainage must soak through as large an amount of earth as possible, or, after reaching a stream, must be exposed to the sun and air for as long a time as possible, before the water is used. As a rule, it is better to take water-supply from rapidly running streams than from any other source, and always some distance above the nearest contamination. Springs, where the high land surrounding them is free from impure drainage, are excellent sources of water-supply. Wells, especially those near dwellings, should be avoided. In all cases where a water suspected of contamination must be used for drinking or cooking purposes, such water should be boiled, and then allowed to cool and settle before it is used. Garbage and rubbish of all kinds near the water-supply may be a source of disease, and such material should be burned or removed.

The following disinfectants are recommended:

First.—P. R. R. DISINFECTANT. This disinfectant is in the liquid form, and is applicable everywhere. Full directions for its use accompany each package. It will be furnished in boxes holding two dozen bottles, upon requisition, from Altoona shops.

Second.—SULPHATE OF IRON OR COPPERAS. This is one of the best common disinfectants, and its virtues and cheapness commend it to general use. It is applicable in all places where iron-stain is no detriment. It should be used freely in the vaults of privies, in cesspools, along the edges of open drains, in sinks and all sewer connections, and in wet places wherever there may be decaying animal or vegetable matter. It must be used neither on fabrics, on floors, nor on painted surfaces. The best method of applying this disinfectant is to dissolve it in water, about two pounds to the gallon, and then pour or sprinkle the liquid in the places where required.

Third.—THE BATTERY RESIDUES FROM THE ORDINARY TELEGRAPH BATTERY, MIXED WITH COMMON SALT, form an excellent disinfectant. The residues should be mixed with common salt in the proportion of a pound and a half of salt to the gallon of residue. The disinfectant thus prepared may be used everywhere in the same manner as "P. R. R. Disinfectant," and in place of it.

Fourth.—ICE is very valuable in preventing decomposition, and in this sense is a good disinfectant. It may be used with great advantage on passenger cars, and in all places where the supply will admit. A lump of ice should be carried in the urinal of every passenger car while the car is in service.

If at any time a case of infectious disease is found at a station in a passenger car, or elsewhere on the company's property, a physician should be immediately sent for. The car should be removed from the train as soon as practicable, the doors locked, and it should not again be used until it has been fumigated.

All employés are expected to heartily co-operate in the above measures for preventing disease, and they are earnestly recommended to apply them also at their own homes.

CHARLES E. PUGH,
General Manager.

OFFICE GENERAL MANAGER,
PHILADELPHIA, April 25, 1885.

THE PAPER-STOCK DEALERS ATTEMPT TO OVERRIDE QUARANTINE REGULATIONS FOR THE PREVENTION OF EPIDEMIC DISEASES.

WHILE our October number was passing through the press, 17th ultimo, a second case of appeal from the decision of Dr. Smith, Health Officer of the port of New York, to have rags from infected ports disinfected before admission to pratique, was made, aided and abetted by a formidable array of interested parties and able counsel. The statement of the case, as presented to the Quarantine Commissioners by Dr. Smith, was as follows:

QUARANTINE, S. I., October 17, 1885.

Commissioners of Quarantine:

GENTLEMEN—I am in receipt of the notice of appeal of Messrs. Lockwood & McClintock and Charles F. Lennig from my decision, that the rags on the ship Lucy A. Nickels, from Hiogo, Japan, not having been disinfected at the port of shipment, should be disinfected at this port before distribution.

The circumstances are identical with those which existed in the case of De Castro & Co., in which case an appeal was made from the decision of the Health Officer, that the rags on the Phillipo, not having been disinfected at the port of departure, should be disinfected before distribution.

The reasons for the decision of the Health Officer in this case, as in that, were based upon:

1. The recommendation of the conference of sanitarians and health authorities, which met at Washington, D. C., December 10 and 11, 1884, that all foreign rags should be disinfected in countries where gathered or at the ports of entry in this country, and the adoption by the Government of that recommendation, the duties, responsibility and supervision of which were relegated to the local health authorities by order of the Treasury Department, June 10, 1885.

2. After the recommendation of certain representatives of health boards and maritime sanitary organizations, the 23d of April last, "that in view of other contagions as well as that of cholera, all rags imported into this country should be disinfected either at the place of departure or on their arrival here."

3. That no exception can be made to the regulation which has been adopted under the advice of one of the most numerously attended and representative health organizations ever convened in the United States, and subsequently by the representatives of most of the maritime sanitary organizations of the North Atlantic ports; and further, chiefly on account of the difficulty of being able to determine the locality in which old rags are gathered, or what part of them may contain elements of danger to the public health.

I need scarcely remind the Commissioners that but a small portion of the empire of Japan is accessible for the purpose of securing statistics of the diseases existing there, and that the system of vital statistics, such as enables our health officers to estimate the extent of prevailing diseases and mortality, in Japan is extremely rudimentary.

The information afforded by the representatives of the United States in that empire as to the number of cases of contagious and infectious disease, and the attendant mortality, is necessarily limited to the small portion of it, and for the most part to the seaport towns, in which resident Europeans have been enabled to secure imperfect reports as to some of the diseases of the class mentioned.

These have been transmitted to the Secretary of State of the United States by the consul, from whose reports an approach to the actual condition has been learned.

For the six months ended June 30, 1885, 4,472 cases of small-pox are reported to have occurred, and 1,191 deaths from that disease; typhoid fever, 7,984 cases, and 2,078 deaths; diphtheria, 1,442 cases, 856 deaths; typhus, 444 cases, 78 deaths.

From the consular reports cholera is known to have existed previous to June 30th of the present year, but to what extent has not been reported. How long or to what extent it has prevailed in interior portions of Japan is not known; but it is known that at the present time it prevails at Nagasaki and other seaport towns in Japan.

Three years since it prevailed to serious extent in many portions of Japan, and, from present appearances, seems likely to resume its deadly march throughout the empire. Nevertheless, bills of health, as in the case of the ship Lucy A. Nickels, are "clean," and shippers of rags, as in this case, make affidavit that "the rags have neither been collected, packed, or otherwise placed, nor passed through any district infected with cholera or other infectious disease."

What man of common-sense believes that affidavit?

But a few months since a shipper of rags from Japan made affidavit that there was no case of infectious or contagious disease in the empire of Japan, and the evidence was duly

certified by the United States consul. Distance lends enchantment to the view is the old saying, and on this principle it is believed the exporters of Japanese rags act when they undertake to make the health authorities believe, in the interest of their business, that Japan should be the Mecca of health-seekers and would-be life preservers.

It is absurd to say that a cargo of three or four thousand bales of rags can be gathered and packed without passing through any district infected with cholera or other infectious diseases in a population of 50,000,000 of people, as the affidavit of the shippers of these rags affirms; or that no case of infectious or contagious disease exists in an empire like Japan, as did the previous affidavit. The shipper of merchandise who makes such an affidavit, who takes a solemn oath that it is true, falls below the juggler who deceives by his sleight of hand; for the one professes to deceive and the other to be an honest man.

Fortunately the United States Government has established its outposts on this boundary of American and European civilization, and sanitarians have followed hard upon that civilization, and the proofs are abundant that the Japanese are subject, not only in like manner as we are to the same diseases which afflict our common humanity, but to a degree greater in proportion to their ignorance of the restraining and improving influence of modern sanitary reforms.

The apprehension as to the entry and distribution of Japanese rags at the port have existed in the mind of the Health Officer for a long time.

In 1883 a cargo of these rags was refused permission to discharge by the regulation of the Health Officer. The ignorance, to say the least, of the consignees of such cargoes, in some instances, of the quality or condition of the rags was illustrated in this instance.

The Health Officer was assured that the cargo consisted of new clippings. To affirm or disprove this statement the Health Officer visited the vessel, and, in the presence of the clerk of the consignees, several bales were opened to an extent sufficient to discover the character of the contents. Instead of new or even clean clippings, the refuse of Japanese clothing, fragmentary articles of their wear that were stained and discolored with filth that only could have been secured from long use and contact with the slums of the street, were found.

I beg leave to remind your honorable board that it is a fact that will not be disputed, I think, that fifteen per cent. of the weight of rags such as are received from Egypt, Japan, and many other localities, in dirt, is beaten from them at the manufactories.

Only the representative of an English firm applied to the

Health Officer to know if rags which had been submitted to a process which extracted certain fertilizing properties from them, and subsequently dried and baled, would be allowed to pass the quarantine as disinfected rags, the fertilizing qualities of the rags being the principal object of the manufacturers.

It will be, as it has been, argued that rags do not convey contagion. One alone of hundreds of instances the undersigned begs leave to refer to to disprove that assumption, found in the Massachusetts State Board of Health Report for 1873, page 468. Extracts from table showing cases of small-pox in the State in 1872 and the first month of 1873:

City or town.	Number of cases.	Number to Feb. 1, 1873.	Probable source of infection.
Adams	34	..	Paper rags.
Blackstone	10	..	"
Cunnington	19	..	"
Dighton	17	..	"
Fitchburg	24	1	"
Holyoke	32	..	"
Huntington	3	..	"
Lee	14	1	"
Montgomery	6	..	"
West Boylston	1	..	"
West Springfield	13	4	"
	172	6	
Also—			
South Hadley	8		
Dalton	16		

Again it will be, as it has been, urged that the long distance those rags were brought, and the lapse of time since they were gathered, will prevent the possibility of their communicating contagious or infectious disease.

I refer the board to a single instance of many in which the evidence is conclusive that the contagion from the sick may be carried thousands of miles, and after months of time communicate disease to other persons.

"It is well authenticated that during the epidemic of 1873 cholera was introduced in the effects of immigrants. The vessels which brought them were in perfect sanitary condition. Passengers were healthy, and remained so after landing until they reached Carthage, O., Crow River, Minn., and Yankton, Dak., where their goods were unpacked. At each place within twenty hours after poison particles were liberated the first cases appeared."

If packed clothing may retain the contagion, why not baled rags? The very closeness and unventilated condition of baled rags favors the retention of the vitality of disease germs for an

indefinite time. See cases reported in the *British American Journal*, vol. ii., 1884, page 629.

It has often been asserted that no case of cholera has ever been known to occur from exposure to rags. I invite the attention of the Commissioners to the pages of the New York *Medical Journal* of August 29, 1885, containing a letter from Dr. Sonderegger, president of the Swiss Aerzte Commission.

Believing as I do that it is the duty of importers of rags to cleanse this refuse material somewhere, in some way, by some system of disinfection which sanitarians and health authorities shall approve, and that will render them as unobjectionable as ordinary merchandise, and with the assurance that I shall be happy to co-operate with them to secure that result by any effective system, and with the least possible expense, I again submit the decision of this matter, as under the law it is given you to decide, feeling that I have discharged my duty by the light and judgment I have.

Very respectfully,

WM. M. SMITH,
Health Officer Port of New York.

Mr. Vanderpoel, of stock dealers' counsel, objected to the return as it was not sworn to, and further, on the ground that there was no fact stated therein as to the rags in question. The Health Officer, he said, in using the discretion given him by law, was bound to base it on reasonable facts, and such facts he had not presented. He did not understand that Dr. Smith thought there was any infection in the rags, to which Mr. Quarantine Commissioner Platt replied: "Only by inference."

Mr. Vanderpoel said that if the Health Officer did think there was infection in the rags, he was bound to keep the vessel in quarantine, and after so stating the speaker asked Dr. Smith if he so thought; and if he did not, what information had he received as to it since the vessel came up the bay?

Dr. Smith said that he allowed the vessel to come up under a conditional permit, it being his desire to lighten the burden as much as possible.

This did not satisfy Mr. Vanderpoel, who repeated his question several times. Dr. Smith said that it was the presumption that any bale of rags might contain contagion or infection, and he made that presumption under the rights given him by the law. These rags came from a country where the cholera and small-pox had been reported within three years.

The whole of Japan was overrun with cholera and the population was decimated.

Mr. McRae, of counsel for Lockwood & McClintock, then elicited from the doctor, in reply to his questions, that he was unable to believe that the sworn declaration of the shipper was true, but if he knew it to be so of his own knowledge he should say that the rags were not infected. His experience had been that such declarations were greatly to be mistrusted, and therefore he acted within the scope of his discretion.

C. A. Meyer, of Meyer & Co., testified that these rags were all collected in the city of Osaki, which was about eighteen miles distant by railroad from Hiogo, the port of shipment. His firm had warehouses at both places, and had hundreds of men working for them. The rags in question had been in their possession for eighteen months. He had lived in Hiogo for eight years and a half, and, so far as he knew, there was no contagious or infectious disease in either city during that time. He was in Osaki four or five times a week. Rags are not shipped from other points to Osaki, because the price is too low to admit of paying for transportation. Osaki has about a million and a half inhabitants, and Hiogo about three hundred thousand, there being about five hundred Europeans at the latter place.

C. M. Nickels, captain of the Lucy A. Nickels, testified that there was no cholera existing in Osaki or Hiogo, and that none of his crew were sick from any cause an hour during the one hundred and sixty days' voyage. Part of the rags were baled while he was there, they being loaded as fast as the bales were made up. The rags were in the warehouses of Meyer & Co., and he was there every day or two, and saw hundreds of natives working among the rags.

W. P. Prentice, counsel for Dr. Smith, called attention to a case of disease communicated by rags in a Swiss paper-mill in 1867.

Augustine Smith said that that was only one case, and it was seventeen years old, and then, after stating that Dr. Sternberg, who reported the case, was employed by the Government to examine and report about cholera, the speaker added, "I understand from Dr. Smith that he (Dr. Sternberg) was employed by him and by the Patent Disinfecting Company."

Dr. Smith—The gentleman does not understand me to say so.

Augustine Smith—You told me so.

Dr. Smith—I never told the gentleman so.

Augustine Smith—You said you paid him $30.

Dr. Smith—I say I never had any knowledge of what was paid him, except what I paid him myself. I said I understood that he was paid $100 by the company as an expert. He charged me $30 for making certain experiments. The letter referring to this case was written, not by Dr. Sternberg, but by Dr. Sonderegger, the President of the Swiss Commission, and reports that one woman, who tore the rags apart, was taken sick. On the following day sixteen more were attacked, and eleven died.

When asked if he had seen a circular from Dr. Hamilton stating that the period for a visitation of cholera had passed, Dr. Smith said: "I have not, and I would have very little respect for such an order, in face of the fact that cholera at one time appeared in this port as late as December 5th.

W. W. MacFarlane, counsel to the Quarantine Commissioners, made a few remarks, advising the board that, so far as the sanitary questions were concerned, it must defer to the Health Officer.

The board went into executive session, and affirmed the decision of the Health Officer. Commissioner Judd voting in the negative.

On Monday, October 19th, the Commissioners received the following communication:

GENTLEMEN—Where have you ordered the rags on board the *Lucy A. Nickels* to be taken for disinfection, and how? Yours, etc., LOCKWOOD & MCCLINTOCK.

Commissioner Judd offered the following resolution, which was adopted and sent to counsel:

Resolved, That the counsel of the board be requested to immediately advise whether the Commissioners of Quarantine have any authority to order the rags requiring disinfection now on board the ship *Lucy A. Nickels* sent to any particular point for such disinfection.

Counsel's reply was as follows:

To the Board of Quarantine Commissioners:

I do not think you have any original jurisdiction to direct what place, or within what territorial limits, goods shall be disinfected. Your jurisdiction in respect to that matter is appellate, not original. The Health Officer has, I think, under section 37, power to prescribe the general locality within which the process of disinfection must take place. It was doubtless the intention of the statute (sec. 22) that merchandise should be disinfected at the quarantine warehouses, and there is, therefore, no special provision for any other place or places, nor express mention in respect to the Health Officer's power to direct as to the place of disinfection; but, in a case where he has directed that disinfection is necessary, he clearly has the power to require it to be done under such circumstances as not to endanger the public health, and this involves his right to say that it cannot be done at certain places or within certain limits, but hardly, I should say, to require that it should be done at some particular place to be designated by him.

W. W. MACFARLANE.

Commissioners Nichols and Platt have recorded their reasons for sustaining the decision of the Health Officer. The document concludes as follows:

While the Commissioners undoubtedly have the power, by reason of their appellate jurisdiction, to overrule the decision of the Health Officer, it is a power involving, in a case of this character, very grave results. The Health Officer is a physician. His professional study and his official duty both require him to be well acquainted with this general subject, while in matters of general administration relating to subjects not necessarily involving expert knowledge, such as the present calls for, the Commissioners, in case of appeal, would feel no hesitation in acting upon their own independent judgment. Such a case as the present, the responsibility, from the nature of the subject, must in the main rest upon the Health Officer himself. No sufficient reasons having been shown by the appellant in this case, in the opinion of the Commissioners, for overruling the decision of the Health Officer and taking this case out of the general rule requiring disinfection of rags, the decision of the Health Officer is therefore confirmed.

(Signed) T. C. PLATT,
J. A. NICHOLS.

The dissenting Commissioner, Judd, has made himself conspicuous as a newspaper correspondent in defence of the paper-

stock dealers, and has several times published *his* opinion that the Quarantine Commissioners, and not the Health Officer, should be the judge of the necessity of disinfection! And Mr. Augustine Smith, Vice-President of the American Paper-makers' Association, has profusely assailed disinfection by heat through the press, because it is a patent process and a "job;" and so enthusiastic has he become, and so conscientious with regard to any exclusive process or profits arising therefrom for the time, that he has completely overlooked his own patent "job" for making a certain kind of paper, for which he charges more than threefold the cost, and would not have *that* job render a fraction of a cent less, even though the whole country should be overrun with cholera and small-pox.

REMARKABLE LONGEVITY—THE ALLEN FAMILY.—Dr. Nathan Allen, of Lowell, Mass., contributes to the *Mail* of that city an article on health and longevity, in which, by way of illustration, he cites the following remarkable facts from the records of his ancestors: "In 1750 two brothers, Jonathan and Nehemiah Allen, went from Sudbury to Barre, when the latter place was a comparative wilderness. They belonged to the third generation from Walter Allen, who died in Charlestown in 1681, and willed to his oldest son, John, a 'Watertown farm' of two hundred acres, which afterward became a part of Sudbury. Those two brothers, with wives from Lexington and Concord, settled in Barre as farmers. Jonathan Allen and wife died at the ages of 92 and 87. They had seven children, one dying in infancy; but three sons and three daughters died at these ages: 67, 72, 77, 86, 87, and 88, with an average, including the fractions of a year, of over 80. Nehemiah Allen and wife died at the ages of 87 and 66. They had ten children—four sons and six daughters—dying at these ages: 78, 80, 80, 82, 84, 92, 92, 95, 96, and 96, making an average of 87½, and with the fractions of a year added it makes an average age of over 88. There were five out of the number ranging above 90, and three coming up to almost 100. It is doubtful whether another instance of so large a family, all its members reaching so great an age, can be found in the whole history of New England. Most, if not all, of these persons lived in Barre and vicinity, and were engaged in agricultural pursuits."

STATE MEDICINE IN PENNSYLVANIA.

AN ACT TO ESTABLISH A STATE BOARD OF HEALTH, FOR THE BETTER PROTECTION OF LIFE AND HEALTH, AND TO PREVENT THE SPREAD OF CONTAGIOUS AND INFECTIOUS DISEASES IN THIS COMMONWEALTH.

SECTION 1. *Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same,* That the Governor, by and with the advice and consent of the Senate, shall appoint six persons, a majority of whom shall be physicians of good standing, graduates of regularly chartered and legally constituted medical colleges, and of not less than ten years' experience in the practice of their profession, and one of whom shall be a civil engineer, who, together with the secretary, the mode of whose appointment is hereinafter provided for, shall constitute and be designated as the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania. Of the six persons first appointed, two shall serve for two years, two for four years, and two for six years from the first day of July next following their confirmation; and the Governor shall thereafter biennially appoint, by and with the advice and consent of the Senate, two persons, of the same professions as those whose terms of office have just expired, to be members of said board, to hold their offices for six years from the first day of July next following their confirmation, and until their successors are appointed, excepting the secretary, who shall continue in office as hereinafter provided; but any member may be re-appointed. Any vacancy occurring in said board during a recess of the Legislature shall be filled by the Governor until the next regular session of the same.

SECTION 2. As soon as possible after the appointment of the first six persons as aforesaid, they shall meet in the office of the Secretary of the Commonwealth, and shall proceed,

under the direction of the latter officer, to determine by lot which of them shall serve for the respective terms of two, four, and six years. Before entering upon the duties of the office they shall take the oath prescribed for State officers by the Constitution of the State, and shall file the same in the office of the Secretary of the Commonwealth, who, upon receiving the said oath of office, shall issue to each a certificate of appointment for his respective term of office determined as aforesaid; upon receiving which they shall possess and exercise the powers, and perform the duties, of said board as defined in this act. Immediately after having taken the oath of office, they shall organize by electing one of their number to be president, and by appointing a proper person, who shall be a physician of good standing, of not less than ten years' professional experience, and a graduate of a legally constituted medical college, to be secretary of said board, who shall hold his appointment until removed by the appointment of his successor or otherwise. The board may elect one of its own members secretary, in which case the vacancy thus created shall be filled by the Governor in the same manner as a vacancy caused in any other way. The president shall be elected annually. No member of the board except the secretary shall, as such, receive any salary; but the actual travelling and other expenses of any member, while engaged on the actual duties of the board, shall be allowed and paid on presentation to and approval by the Auditor General of an itemized account with vouchers annexed.

SECTION 3. The secretary shall be the executive officer of the board, and shall have all the powers and privileges of a member of said board, except in regard to voting upon matters relating to his own office and duties as secretary. He shall receive an annual salary of two thousand dollars, which shall be paid him in the same manner that salaries of other State officers are paid; and such necessary expenses as the Auditor General shall audit, on presentation of an itemized account with vouchers annexed and the certificate of the board, shall be allowed him.

SECTION 4. The said board shall meet at least once every six months, and may also hold special meetings as frequently as the proper and efficient discharge of its duties shall require,

in the capitol building at Harrisburg (unless otherwise ordered), and the rules or by-laws of the board shall provide for the giving of proper and timely notice of all such meetings to every member of the board. The Secretary of Internal Affairs shall provide and furnish such apartments and stationery as said board may require in the discharge of its duties. A majority of the members of the board shall, at any regular called or adjourned meeting, organize and constitute a quorum for the transaction of business.

SECTION 5. The State Board of Health and Vital Statistics shall have the general supervision of the interests of the health and lives of the citizens of the Commonwealth, and shall especially study its vital statistics. It shall make sanitary investigations and inquiries respecting the causes of disease and especially of epidemic diseases, including those of domestic animals, the sources of mortality, and the effects of localities, employments, conditions, habits, food, beverages and medicine, on the health of the people. It shall also disseminate information upon these and similar subjects among the people. It shall, when required by the Governor or the Legislature, and at such other times as it deems it important, institute sanitary inspections of public institutions or places throughout the State. It shall codify and suggest amendments to the sanitary laws of the Commonwealth, and shall have power to enforce such regulations as will tend to limit the progress of epidemic diseases.

SECTION 6. In cities, boroughs, districts, and places having no local board of health, or in case the sanitary laws or regulations in places where boards of health or health officers exist should be inoperative, the State Board of Health shall have power and authority to order nuisances, or the cause of any special disease or mortality, to be abated and removed, and to enforce quarantine regulations, as said board shall direct.

Any person who shall fail to obey, or shall violate, such order shall, on conviction, be sentenced to pay a fine of not more than one hundred dollars at the discretion of the court.

SECTION 7. It shall be the duty of the State Board of Health and Vital Statistics to have the general supervision of the State system of registration of births, marriages and deaths, of prevalent diseases, and of practitioners of medicine and surgery, to prepare the necessary methods, forms, and blanks for

obtaining and preserving such records, and to insure the faithful registration of the same in the several counties and in the Central Bureau of Vital Statistics at the capital of the State. The said board shall recommend such forms and amendments of laws as shall be deemed to be necessary for the thorough organization and efficiency of the registration of vital statistics throughout the State. The secretary of the State Board of Health and Vital Statistics shall be the superintendent of registration of vital statistics; as supervised by said board, the clerical duties and safe keeping of the bureau of vital statistics thus created shall be provided for by the Secretary of Internal Affairs, who shall also provide and furnish such apartments and stationery as said board shall require in the discharge of such duties.

SECTION 8. It shall be the duty of all health officers and boards of health in the State to communicate to said State Board of Health copies of all their reports and publications, and also such sanitary information as may be requested by said board. And said board is authorized to require reports and information (at such times and of such facts and generally of such nature and extent as its by-laws or rules may provide) from all public dispensaries, hospitals, asylums, infirmaries, prisons and schools, and from the managers, principals, and officers thereof, and from all other public institutions, their officers and managers, and from the proprietors, managers, lessees and occupants, of all places of public resort in the State; but such reports shall only be required concerning matters or particulars in respect of which it may, in its opinion, need information for the proper discharge of its duties.

SECTION 9. Said board may, from time to time, engage suitable persons to render sanitary service or to make or supervise practical and scientific investigations and examinations requiring expert skill, and to prepare plans and reports relative thereto. But no more than two thousand dollars shall be expended in any one year for such special sanitary service.

SECTION 10. It shall be the duty of said board, on or before the first Monday of December in each year, to make a report in writing to the Governor of this State upon the sanitary condition and prospects of the State; and such report shall set forth the action of the said board and its officers and

agents, and the names thereof for the past year, and may contain other useful information pertinent to the objects for which it was created, and shall suggest any further legislative action or precaution deemed proper for the better protection of life and health; and the annual report of said board shall also contain a detailed statement of the State Treasurer of all money paid out by or on account of said board, and a detailed statement of the manner of its expenditures during the year last past, but its total expenditure shall not exceed the sum of five thousand dollars in any one year.

SECTION 11. The sum of ten thousand dollars ($10,000) is hereby appropriated from the treasury for the purposes of this act and the expenditures properly incurred by the authority of said board and verified by affidavit, subject however to the limitations hereinbefore imposed, and shall be paid by the Treasurer upon the warrant of the Auditor General.

SECTION 12. This act shall take effect immediately, and all acts or parts of acts inconsistent herewith shall be, and are hereby, repealed.

APPROVED—June 3, 1885.

ROBERT E. PATTISON,

Governor.

ADDRESS OF THE "STATE BOARD OF HEALTH AND VITAL STATISTICS OF THE COMMONWEALTH OF PENNSYLVANIA," TO THE PEOPLE OF PENNSYLVANIA.

THE "State Board of Health," called into existence by the will of the people of this great Commonwealth, expressed through its representatives in General Assembly met, and approved by its chief executive, enters upon the discharge of its grave duties and the exercise of its important powers, deeply impressed with the sense of the responsibilities which devolve upon it, and reverently invoking the blessing of the God of nations upon its labors. It desires at the outset so to define its position as to lead to the immediate establishment of those friendly reciprocal relations between itself and the public, which can be securely founded only upon a vigilant care for

the well-being of the people by the State, on the one side, and "a decent respect for the government by the people," on the other.

It is not too much to say that the creation of this board marks a new era in the history of the State, since it indicates the recognition by our legislators of the truth, reflected from the minds of the people, once so well formulated by England's brilliant prime minister, Lord Beaconsfield, that "the health of the people is the first duty of the statesman." The "DECLARATION OF RIGHTS" which constitutes Article I. of the Constitution of this Commonwealth, and is therefore a part of its organic law, proclaims that "all men have certain inherent and indefeasible rights; among which are those of enjoying and defending life and of pursuing their own happiness." It is the conviction of this Board that these necessarily include the inherent right to the enjoyment of pure air, pure water, and pure soil, since without them life can neither be enjoyed nor successfully defended, and the pursuit of happiness becomes a cruel mockery. It further conceives one of its paramount duties to be to see that no man or combination of men, however rich or powerful, shall be allowed to trespass on these rights of the humblest citizen, whether from negligence, from greed of gain, or simply from ignorance. It is no mere empty figure of speech, by which we call disease a public enemy. It requires to be met with organized resistance, and this resistance must be directed by a responsible head. When pestilence invades our borders, that head must be clothed with powers analogous to those of a general when the foe is at the gates. Sanitary law, in place of martial law, is then proclaimed, and what are, in times of general health, recognized as sacred rights of person and property, are sternly set aside. When such emergencies arise, as they inevitably must at some time, and as they possibly may at no distant day, the Board confidently looks to the sound sense and self-control of the people to lead them to submit cheerfully to whatever temporary inconveniences it may be deemed necessary to impose. The abridgement of the license of the individual—nay, at times, even of his rights—for the sake of protecting the rights of the community, is the very foundation-stone of civilized life. Civil organization cannot exist without it. Hence, restrictions are placed upon certain

kinds of business which threaten injury to human beings. We prohibit the merchant from exercising his right of unrestricted barter and sale and storage in the matter of explosives. He is not allowed to keep any considerable quantity of gunpowder, nitro-glycerine, or dynamite within certain limits, or within a certain distance of an inhabited house. Every one acquiesces in the justice of this restriction of his rights. But if a powder magazine had exploded in the heart of Philadelphia on January 1, 1872, this calamity, frightful as it would have been, would not have caused a tithe as many deaths—would not have produced a hundredth part as much suffering, would not have inflicted an approach to as great a pecuniary loss, as did the epidemic of small-pox which was then raging. Thousands of lives, tens of thousands of maimed, disfigured or invalided persons, millions of money—such was the cost of that explosion of disease. Is it too much to insist that all our citizens shall submit to that slight infringement of their personal rights, which an immense majority voluntarily undergo, in order that another such calamity shall henceforth, forever, be an impossibility within the borders of this Commonwealth?

Heretofore it has been only a straggling, desultory warfare which has been waged against preventable disease within our borders. Isolated health-boards and solitary sanitarians, here and there, have carried on a gallant fight, but against great odds, because lacking the element of intelligently combined action which is essential to success. A prominent English medical review, in speaking of our fragmentary and disjointed system of hygienic administration, if system it can possibly be called, says: "There is much good work done under a species of semi-authority and sufferance, and by volunteer exertion; but the plaint is the lack of a central authority and administrative power to make sanitary supervision an effective reality. The water-supply of a considerable portion of a great city is abominably polluted, but no sufficient authority is found to remedy it; there are numerous and deplorable nuisances but no efficient inspectors, there are many factories and work-shops, but no laws to secure their hygienic condition or the physical well-being of those employed in them; there is evidence, unmistakable, of the sale of unwholesome and adulterated food, but it is nobody's business to meddle with it and protect the

public, there are on all sides complaints of building operations in defiance of sanitary laws, and no one with authority to attend to them and take action against them; and lastly, intramural interments stand condemned in all civilized communities, but the public authorities of the American cities have no power to stop them." It will be the business of this Board to see to it that this stigma upon our civilization is removed; to collect and co-ordinate these scattered forces, marshalling them into a regular army of well-drilled sanitary troops, armed and equipped with all the appliances that modern science can suggest for stamping out pestilence and conquering contagion; to strengthen feeble organizations, and to establish new ones where none exist, until there shall not be a hamlet in the entire domain of the State without its regularly constituted health officers in direct communication with the central head.

Where the hygienic interests of different sections appear temporarily to conflict, the Board will use its best efforts to harmonize them. It often happens that the sanitary undertakings of one city prove the opposite of health-giving in their results in regard to another. The towns and cities which line the Schuylkill, for example, meritoriously wash themselves in that limpid stream, and so far do well; but unhappy Philadelphia, with the typhoid virus creeping through her veins, shudders as she unwillingly drinks their defiled washings. That they do this at their peril the story of afflicted Plymouth only too clearly demonstrates, for let it not be forgotten that Philadelphia sowed the seed from which death has just reaped so fearful a harvest in that far off mountain village. Hence the necessity for the consideration on the part of the central sanitary authorities of the difficult problem afforded by "the pollution of rivers," in a broad, generous spirit, with a view to determining methods whereby one community may improve its own health conditions without impairing those of a neighbor.

In an immense territory like our own, larger than that of most of the nations of Europe, with its great diversity of surface, its lofty mountain ranges and its immense forests, wonderful opportunities exist for sanitary engineering on an immense scale, determining in what directions water-sheds shall be encouraged and in what diverted, to what extent private

corporations are allowed to jeopardize the health of large sections of the country by obstructing natural water-courses, for the purposes of manufacture or navigation; deciding how far certain forests act as natural barricades against devastating winds and should therefore be left untouched by the axe, in order to maintain a permanent average rain-fall, and thus avert draughts, cyclones and floods, and how far others interfere with the circulation of healthful breezes and may therefore be with benefit removed.

With a rapidly growing population, and the frequent development of new centres of wealth and industry, much effective sanitation for the future can be accomplished in supervising the laying out of new towns. No village must be allowed, from this time forth, to take the simplest corporate form without laying before this Board a carefully prepared plan of its sanitary provisions. Inquiry will be made into the character of the soil, the quantity and quality of the possible water-supply, the width and inclination of its streets, whether its projected system of sewerage is wise and scientific, whether its surface drainage takes advantage of the natural water-courses, its regulations in regard to habitations, the space of ground allowed to each, and the space required in each in relation to the number of occupants. All these are points which enlightened sanitary science demands should be arranged, with a wise prescience, in advance, and not left to settle themselves hap-hazard as emergencies may arise, after fearful sacrifices of health and life, and at an immense outlay of money—as our older cities are finding out to their cost.

The Board must also consider the relations of the country to the city as a purveyor. The supply of fresh vegetables and fruits, and pure milk and other dairy products to large communities, is of the utmost importance, and every effort will be made to require and ensure it. The transportation of live stock for food needs to be very carefully watched and regulated, both that none but healthy and therefore wholesome meat may be exposed for sale, and that infectious and epidemic diseases may not be introduced among our native herds and flocks from other localities; and although this subject has not been neglected by a co-ordinate branch of governmental supervision, the Board feels assured that any assistance which it may ren-

der in so important a matter will not be considered as impertinent.

But to attempt to briefly indicate, even, all the directions in which this organization hopes to add to the welfare and prosperity of the State, would be to write a volume, instead of carrying out its intention, simply to speak a word. The intimate connection between a high standard of public health and material prosperity cannot be gainsaid. A human life has an actual cash value to the community as certainly as that of a horse or a cow. Fifteen million dollars would not cover the loss to this State from preventable disease in a single year. Hence, the money spent in sanitary precautions and improvements is repaid with compound interest in the longevity and productive capacity of the population. Its disbursement is economy of the wisest kind, worthy of the most sagacious statesman.

But while it is true that the subjects confided to the consideration of this Board involve the profoundest problems of political economy and the most intimate researches of scientific investigation, it is not less true that every home and every hearth in the Commonwealth is deeply interested in the practical results to which it shall attain. Every vacant chair by the fireside, every empty place at the table, whose beloved occupant was snatched away by the ruthless hand of contagious or preventable disease, is a mute appeal for more searching inquiry into the causes and means of prevention of such diseases by the health authorities, and more general interest in their labors, and readier acquiescence in their decisions, by the community at large and its individual members. The Board therefore earnestly invokes the conscientious co-operation of every householder to the extent of keeping his own home and other buildings of which he may have supervision in a healthful condition.

Especially does it desire that the women of the State should take an active and intelligent interest in the practical solution of the problems of home hygiene and sanitation. The establishment of the first State Board of Health in the United States was effected by the efforts of a woman. Reference is made to that Board whose work has been so effective and thorough, that it has been looked to as a model by other similar organ-

izations—that of Massachusetts, now in the sixteenth year of its existence. The ancients were right in making the divinity of health a goddess rather than a god; for woman, as wife, mother, nurse, has for her special function that daily ministry to the bodily welfare and daily necessities of offspring and of husband, that constant presence in and care of the home, which are such essential promoters of health in the individual, in the family and in the community. The Board is especially urgent, then, that the mothers of the land should attentively study the leaflets and tracts which it will from time to time issue, giving plain, practical advice as to the best methods of preventing the spread of infectious diseases, and of making their homes the abodes of health, and therefore of happiness.

The Board proposes to indulge in no display of sanitary pyrotechnics in order to dazzle the public and create for itself a factitious importance, but rather by quiet, steady, carefully considered work, to organize sanitary effort, to acquaint itself with the health conditions of every quarter of the State, and to diffuse information which shall develop an enlightened public sentiment in regard to both rights and duties from a sanitarian standpoint. Especially will it recognize the necessity for moving with caution where the interests of trade, manufacture, or commerce apparently conflict with those of public health, aiming always to protect the latter with the least possible interference with the successful promotion of the former.

But, on the other hand, if the Legislature of this Commonwealth, acting with its usual wise conservatism, has been slow in establishing this safeguard to the lives and health of the people, the latter may congratulate themselves that a much stronger law has now been enacted than could possibly have been passed when the first application for such legislation was made. Instead of being only a statistical and advisory body, as must then have been created, the present Board has been endowed with ample powers to enforce its regulations for the protection of the public, and this grant imposes a responsibility which the Board recognizes and will not hesitate to assume if occasion demand.

The Board cannot find more fitting language in which to conclude this address than that employed in a recent admirable circular issued by the Board of Health of the city of Phila-

delphia "for the guidance of citizens in the management of their dwellings and for personal application." It is as follows: "While the health of the community depends in great degree upon a rigid observance by officials of all the laws of public hygiene, it is no less dependent upon the faithful application of the principles of hygiene on the part of individuals. To accomplish the best results, the earnest and cheerful co-operation of the people with the health-authorities in all matters pertaining to the general health is absolutely indispensable."

ED. WM. GERMER, M.D., *President.*
PEMBERTON DUDLEY, M.D.
J. F. EDWARDS, M.D.
DAVID ENGELMAN, M.D.
RUDOLPH HERING, C.E.
J. H. MCCLELLAND, M.D.
BENJAMIN LEE, M.D., *Secretary.*

OFFICE OF THE
SECRETARY OF THE COMMONWEALTH.
HARRISBURG, *July* 3, *A. D.* 1885.

AMERICAN PUBLIC HEALTH ASSOCIATION, 1885.

THE THIRTEENTH ANNUAL MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION will convene in WASHINGTON, D. C., *Tuesday, December 8th, at* 10 *o'clock A.M., and continue four days. The meetings will be held in Willard's Hotel Hall, on Pennsylvania Avenue.*

The Executive Committee have selected the following topics for consideration at said meeting:

I. THE BEST FORM IN WHICH THE RESULTS OF REGISTRATION OF DISEASES AND DEATHS CAN BE GIVEN TO THE PUBLIC IN WEEKLY, MONTHLY, AND ANNUAL REPORTS.

II. THE PROPER ORGANIZATION OF HEALTH BOARDS AND LOCAL SANITARY SERVICE.

III. RECENT SANITARY EXPERIENCES IN CONNECTION WITH THE EXCLUSION AND SUPPRESSION OF EPIDEMIC DISEASE.

Also the Lomb Prize Essays elsewhere mentioned.

In addition to able and comprehensive papers expected to

be presented at this meeting, the Secretary has received notice of the following from the able and well-known writers named below :

" Forms of Tables for Vital Statistics," by Dr. J. S. Billings, LL.D., U.S.A., Washington, D. C.

" Statistics of Consumption in Rhode Island for a Quarter of a Century," by Dr. C. H. Fisher, Secretary State Board of Health, Providence, R. I.

" The German System of Physical Training," by Dr. E. M. Hartwell, Johns Hopkins University, Baltimore, Md.

" School Hygiene, Public and Private," by Dr. William Oscar Thrailkill, San Francisco, Cal.

" Sanitary Protection of New Orleans, Municipal and Maritime," by Dr. Joseph Holt, President State Board of Health, New Orleans, La.

" Maritime Sanitation," by Dr. S. T. Armstrong, U.S.M. H S., Memphis, Tenn.

" Small-pox in Canada, and the Methods of Dealing with it in Different Provinces," by Dr. P. H. Bryce, Secretary Provincial Board of Health, Toronto, Ont.

" The Debit and Credit Account of the Plymouth Epidemic," by Dr. Benjamin Lee, Secretary State Board of Health, Philadelphia, Pa.

" An Epidemic of Typhoid Fever," by Dr. C. A. Lindsley, Secretary State Board of Health, New Haven, Conn.

" Experiences in Disinfecting Sewers," by Dr. O. W. Wight, Health Officer, Detroit, Mich.

" Progress of Health Work in Kentucky," by Dr. J. N. McCormac, Secretary State Board of Health, Bowling Green, Ky.

" Observations on the Cape Fear River Water as a Source of Water-Supply : A Study into the Character of Southern River-Water," by Dr. Thomas F. Wood, Secretary State Board of Health, Wilmington, N. C.

" The Virus of Hog-Cholera," by Dr. D. V. Salmon, D.V. S., Washington, D. C.

" Hygiene of the Dwelling," by George N. Bell, C.E., Newport, R. I.

" The Proper Disposal of the Dead," by Dr. John Morris, Baltimore, Md.

"The Relation between Micro-organisms and Cells," by Dr. A. C. Bernays, St. Louis, Mo.

"The Layman in Sanitation," by Dr. W. H. Watkins, New Orleans, La.

"Who is Responsible for the Iniquities of the Third and Fourth Generations, and how shall they be avoided?" by Dr. R. Harvey Reed, Secretary State Sanitary Association, Mansfield, O.

"Carelessness the Cause of Disease," by Dr. W. John Harris, St. Louis, Mo.

THE LOMB PRIZE ESSAYS.

MR. HENRY LOMB, of Rochester, N. Y., has offered, as was stated in the preliminary circular, through the American Public Health Association, the sum of $2,800, to be awarded as first and second prizes for papers on the following subjects, and according to conditions advertised early in the year:

I. HEALTHY HOMES AND FOODS FOR THE WORKING CLASSES. First prize, $500; second prize, $200.

JUDGES: Dr. E. M. Moore, President State Board of Health, Rochester, N. Y.; Dr. C. W. Chancellor, Secretary State Board of Health, Baltimore, Md.; Medical Director Albert L. Gihon, U.S.N., Washington, D. C.; Dr. J. H. Raymond, Health Commissioner, Brooklyn, N. Y.; Major Charles Smart, Surgeon, U.S.A., Washington, D. C.

II. THE SANITARY CONDITIONS AND NECESSITIES OF SCHOOL-HOUSES AND SCHOOL-LIFE. First prize, $500; second prize, $200.

JUDGES: Hon. Erastus Brooks, LL.D., State Board of Health, New York; Dr. H. P. Walcott, State Board of Health, Lunacy, and Charity, Cambridge, Mass.; Dr. Granville P. Conn, President State Board of Health, Concord, N. H.; Hon. John Eaton, Commissioner of Education, Washington, D. C.; Colonel George E. Waring, Jr., C.E., Newport, R. I.

III. DISINFECTION AND INDIVIDUAL PROPHYLAXIS AGAINST INFECTIOUS DISEASES. First prize, $500; second prize, $200.

JUDGES: Dr. S. H. Durgin, Health Officer, Boston, Mass.; Dr. J. E. Reeves, Secretary State Board of Health,

Wheeling, W. Va.; Dr. Gustavus Devron, President Auxiliary Sanitary Association, New Orleans, La.; Professor James L. Cabell, LL.D., University of Virginia, Va.

IV. THE PREVENTABLE CAUSES OF DISEASE, INJURY, AND DEATH IN AMERICAN MANUFACTORIES AND WORKSHOPS, AND THE BEST MEANS AND APPLIANCES FOR PREVENTING AND AVOIDING THEM. First prize, $500; second prize, $200.

JUDGES: Dr. E. M. Hunt, Secretary State Board of Health, Trenton, N. J.; Dr. A. N. Bell, Editor SANITARIAN, New York City; Major George M. Sternberg, Surgeon, U.S.A., Baltimore, Md.; Major John S. Billings, LL.D., U.S.A., Washington, D. C.; Mr. W. P. Dunwoody, Secretary National Board of Health, Washington, D. C.

In competition for these prizes *fifty-nine essays have been presented* (the time for presentation expired October 15th). Caligraphic copies of the same are being made, and will be in the hands of the judges before the time of the meeting, so that each paper will be carefully and critically examined.

The judges will meet on Monday, December 7th, at an hour designated by the chairman, and will hold daily sessions till the prize essays are agreed upon. The winning essays will be presented to the Association on Thursday, December 10th.

The COMMITTEE ON DISINFECTANTS will present quite a voluminous report (printed), embodying their investigations and conclusions on the subject of disinfection and disinfectants. This report will be one of great public interest, and will probably be a subject of much interesting discussion.

Full reports are expected from all the committees.

The headquarters of the officers and committees will be at Willard's Hotel.

The first meeting of the Executive Committee will be held Monday, December 7th, at 2.30 P.M.

The subjects for each day's consideration will be stated the previous day, and an official program will appear each morning. Ample time for discussion will be allowed under the rules of the Association, and all discussions will be stenographically reported. The morning sessions will be adjourned at 2:30 P.M., daily, to permit the meeting of the Executive Committee, Advisory Council, and other committees.

Applications for certificates, to enable members and those intending to become members and their families to obtain the reduced rates offered by the various railroad lines to Washington, should be made without delay to the Committee of Arrangements, J. C. McGinn, Secretary, Washington, D. C.

The Committee of Arrangements will issue a circular giving full information regarding reduced railroad fare, hotel rates, etc., in ample season before the meeting.

Reports received from various quarters indicate that the forthcoming meeting will be largely attended, and one of national interest and importance. The subject of the restriction and management of epidemics at the present time is of sufficient importance alone to bring together a large and able body of sanitarians.

All papers offered the Association become its exclusive property, will be copyrighted, and can only be published by consent of the Executive Committee. All reports and papers must be in the hands of the Secretary by December 5th, in order to receive the approval of the committee. After December 3d, all communications to the Secretary should be sent to Willard's Hotel, Washington, D. C.

All interested in the work of the Association are invited to attend.

Ladies are especially invited to attend the evening sessions.

Per order Executive Committee,

IRVING A. WATSON,
Secretary.

EDITOR'S TABLE.

THE "SULPHUR VACUUM" PROCESS OF DISINFECTION.

IT was our privilege to witness the experiment in disinfection by this process, September 25th last, in the presence of Quarantine Commissioner Nichols, Health Officer Wm. M. Smith, Dr. Sternberg, U. S. Army; Dr. J. B. Taylor, Chief of Division of New York Board of Health, for the Prevention of Infectious Diseases; Dr. Briggs, and others. The apparatus consisted of a cast-iron cylinder, sufficiently large to admit a bale of rags, with steam pipe, couplings and steam engine.

The object was to determine whether sulphurous anhydride (SO_2), would penetrate to the centre of the bale of rags, and destroy the germs placed therein, the bale being in a vacuum when the sulphurous anhydride was introduced. A vacuum representing twenty-eight inches was produced, and a pressure of twenty-six pounds from the introduction of the sulphur vapor. During the process, it was impossible to stand near the cylinder, owing to the escape of the vapour through the cast-iron, so the operator said, though the shed under which the experiment was conducted was by no means tight, and the door wide open. Our observation ended during this process.

Dr. Smith reports that the bale of rags used on this occasion did not represent the largest and heaviest bales imported; and so the experiments were repeated October 2d. The exposure of the germs (cholera bacilli and others) and vaccine virus used was about thirty minutes. Dr. Briggs reported that no development of any kind had occurred in any of the cultures made after the exposure to gas at the end of fourteen days, with the exception that after ten or twelve days there was development of a bacillus and liquefied gelatine; but when this was tested by plate cultures, only the rod bacillus was found—presumptive proof that it had been introduced after the exposure of the sulphurous acid in the course of the manipulation at the laboratory. (This was after the experiment of September 25th.) The results of that of October 2d are thus given: "No development of any kind in any of the cultures made by the germs exposed."

In respect to the result of the exposure of vaccine virus in the bales of rags under the same conditions and at the same time that the various germs were exposed, Dr. J. B. Taylor reported that he collected virus the morning of the experiments in each instance, charging six points that were exposed to the gas with the germs. The same number of points were charged from the same calf at the time that those were which were exposed to the sulphurous acid. He vaccinated two children in one family, each on the left arm, with the fumigated virus, and each on the right arm with the non-fumigated. The former failed in both instances, while the latter were both successful. With the remaining points four babies were vac-

cinated, all of which were unsuccessful. Four were also vaccinated with the non-fumigated, all of which were successful. On October 2d, a similar test was made with the same number of vaccine points, taken and treated in exactly the same manner. On the following day six infants were vaccinated with the fumigated virus, and all were failures, as before; while of the six vaccinated with the non-fumigated virus, four were failures and two were successful.

Dr. Smith states that the conclusion in his mind after these experiments, conducted as they have been, with much care and labor, is, that the disinfection of rags by the "sulphur vacuum" system can be efficiently accomplished; and that an arrangement by which one or any number of bales of rags can be introduced into a receptacle in which a vacuum of twenty-five inches or upward is produced, followed by a pressure of twenty-five pounds or upwards, by the introduction of sulphurous acid, and the continued exposure of the rags under these conditions for twenty-five minutes, may be considered as satisfactory disinfection of such rags. At the meeting at which Dr. Smith's report was presented, the Quarantine Commissioners passed a resolution to the effect that it was the sense of their Board that the sulphur process for disinfecting rags arriving at the port of New York was satisfactory to its members.

However this may be, the "arrangement by which one or any number of bales of rags can be introduced into a receptacle," subject to the conditions required, involves obstacles with regard to cost and adaptation which appear to be well-nigh insurmountable for the introduction of this means of disinfection to general use, especially to maritime quarantine purposes, which seems to have been the object of the experiment. As compared with the recently invented apparatus for the application of heat (described in vol. xiv., p. 254), admitting it to be equally efficacious, it is far more cumbersome, requires more time and labor, and incurs considerable danger in its use.

LISTERINE possesses essential properties analogous in their effects to the ozoniferous ethers so highly recommended by Dr. Benjamin Ward Richardson and others as deodorizers

and disinfectants for the sick-room, and should be used in the same way—sprinkled over handkerchiefs, garments, and the bed-linen of fever cases. Mantegazza, "On the Action of Essences and Flowers in the Production of Atmospheric Ozone, and on their Hygienic Utility" (*Rendiconti del Reale Instituto Lombardo*, vol. iii., fasc. vi.), as quoted by Fox on Ozone, reports that the disciples of Empedocles were not in error when they planted aromatic and balsamic herbs as preventatives of pestilence. He contends that a large quantity of ozone is discharged by odoriferous flowers, and that flowers destitute of perfume do not produce it. Cherry-laurel, clove, lavender, mint, lemon, fennel, etc., are plants which develop ozone largely on exposure to the sun's rays. Among flowers, the narcissus, heliotrope, hyacinth, and mignonette are conspicuous; and of perfumes similarly exposed, eau-de-cologne, oil of bergamot, extract of millefleurs, essence of lavender, and some aromatic tinctures. He also points out that the oxidation of the essential oils, such as nutmeg, aniseed, thyme, peppermint, etc., are convenient sources of ozone, and concludes that the ozoniferous properties of flowers reside in their essences, the most ozoniferous yielding the largest amount of ozone. It is of such aromatic essences that Listerine is composed, and hence its efficacy under the circumstances indicated.

NATIONAL, STATE, AND LOCAL BOARDS OF HEALTH REPORTS.

THE NATIONAL BOARD.—Reports of contagious diseases received at this office during October, show that *Small-pox* continues to spread with great rapidity in Montreal and vicinity. During the week ending October 21st, at which date our report closes, there were 394 deaths from the disease in the city of Montreal, and 96 in adjacent municipalities, as against 262 and 70 respectively in the preceding week; and in the first twenty-one days of October nearly 1,200 deaths were reported. Slight outbreaks of small-pox have also occurred at Three Rivers, and at Toronto. At the latter place the Provincial Board of Health appears to have matters well in hand, and there are no indications that the disease will assume an epidemic form. No new cases were reported in Toronto during the week ending October 17th.

Cases of small-pox traceable to persons recently arrived from Montreal have been reported at points in Massachusetts, New Hampshire, New York, and Wisconsin, and at Newark, N. J.; a recent outbreak of the disease was traced to the steamship Eider, on which a number of cases occurred during the voyage.

There were 205 deaths from small-pox in Buenos Ayres during the months of July and August, and consular reports state that the disease has recently made its appearance in Callao, Peru.

Reports received during the month show also that the disease is present in London, Edinburgh, Paris, Rheims, Bordeaux, Antwerp, Copenhagen, Venice, Trieste, Zurich, Prague, Warsaw, and Jerusalem. During the current year small-pox has also prevailed to a considerable extent in Japan. (See October number, p. 368.)

Yellow fever continues present in Havana, though during the present year it has manifested no tendency to take on an epidemic form. The latest reports received from Cardenas, Matanzas, Nassau, San Domingo, Cape Haytien and St. Thomas, show that those ports are free from epidemic diseases.

Reports received during the month from Mexico state that yellow fever has made its appearance at Acapulco, and has become epidemic at Guayamos, at which place there were 200 cases and 47 deaths during the month of September. The disease is believed to have been brought to the city by the steamer Damocrata which arrived August 27th. Of the decedents 26 were officers and soldiers, and the remaining victims were chiefly among the more recent residents of the city.

Yellow fever is also reported as prevalent, and very fatal in Caracas, Venezuela, and cases of a suspicious character have recently occurred in Laguayra.

Cholera.—Reports received during the month indicate that the epidemic in Europe is rapidly abating.

The disease is present in Calcutta, and in Shanghai from August 21st to September 4th there were eight cases and five deaths. Cholera is reported as being more prevalent among the Chinese at this time than it has been for many years.

Following is a synopsis of the reports received during the month concerning the cholera in Europe. In the table relating

to the epidemic in Spain the record of the disease is brought down to September 23d.

Toulon, France, September 5th to 10th, 57 cases and 23 deaths.

Italy, September 17th to 23d, inclusive:

Province.	Cases.	Deaths.
Palermo	1,245	778
Genoa	1	0
Livorno	1	0
Parma	50	33
Reggio-Emilia	4	1
Rovigo	7	3
Ferrara	5	1
Pavia	3	2
Girgenti	1	0
Massa	6	2
Total	1,323	820

Spain, September 3d to 27th inclusive:.

Province.	Cases.	Deaths.	Percentage of Mortality.
Albacete	329	129	39.2
Alicante	189	79	41.8
Almeria	2,012	721	30.8
Badajoz	8	5	66.6
Barcelona	2,475	975	39.7
Burgos	476	165	34.7
Cadiz	1,225	485	39.6
Castellon	454	185	40.8
Ciudad-Real	1,033	513	49.7
Cordova	919	343	37.3
Cuenca	923	347	37.6
Gerona	454	162	35.7
Granada	3,153	903	28.7
Guadalajar	138	44	31.9
Huesca	1,087	252	23.1
Jaen	636	322	50.6
Lerida	629	270	42.9
Logrono	1,626	315	19.4

Province.	Cases.	Deaths.	Percentage of Mortality.
Madrid	902	337	37.4
Malaga	1,458	463	31.1
Murcia.....	609	240	39.4
Navawa.....	2,027	572	28.2
Palencia.....	870	232	26.7
Salamanca	276	102	36.9
Santander.....	310	134	43.2
Segovia.....	390	129	33.1
Soria.....	364	99	27.2
Tarragona.....	900	306	34.0
Teruel.....	637	208	35.4
Toledo.....	958	413	43.1
Valencia.....	332	115	34.7
Valladolid	1,931	631	32.7
Zamora.....	503	172	34.2
Zaragoza	2,293	595	25.9
	32,524	10,963	
Cases and deaths reported to Sept. 2d, inclusive	232,105	86,902	
Total cases and deaths March 4th to Sept. 23d.....	264,629	97,865	36.9

During the week ending September 23d, no cases of cholera were reported in the provinces of Badajoz, Guadalajar and Teruel, and during the same period but five cases were reported in the province of Alicante, none of which proved fatal. W. P. DUNWOODY, Secretary.

EXTRACTS FROM REPORT ON CHOLERA, U. S. S. OSSIPEE.

KIOBE, JAPAN, September 4, 1885.

Edwin Herbert, paymaster, died of cholera, August 29th, at 2 A.M.

John McCourt, seaman, died of cholera, August 29th, at 2.20 P.M.

H. P. Siebert, first-sergeant of marines, died of cholera, August 29th, at 3.35 A.M.

Alonzo H. Lane, ordinary seaman, died of cholera, August 31st, at 7.30 P.M.

Thomas Cassidy, ship's carpenter, died of cholera, September 3d, at 5 A.M.

During the afternoon of the 29th, after consultation with the senior surgeon, closed all the openings to the berth-deck, took out the stop-valve of steam pipe to the capstan engine, and turned the steam on from the main boilers; kept the hatches closed for two hours, and after opening up the deck found that the heat had been so intense as to blister all the paint work of the deck and coamings of the hatches, utterly destroying all leather-work that was below. The men's clothes were kept below so as to subject them to the steam heat.

Fortunately at this place, Kiobe, there are excellent accommodations for ships situated as we were, and the authorities on shore having most kindly placed everything at our disposal, on Sunday we sent all our sick men to the Quarantine Hospital, P. A. Surgeon Russell being sent in charge of them. On Monday we landed all the crew, except a few to look out for her. The ship has been most thoroughly disinfected, the berth-deck having been twice fumigated with sulphur, and all other parts once. Besides this the hold has been fumigated, as well as the paymaster's clothing room; and the bilges, store-rooms, etc., have been thoroughly disinfected by the use of chloride of lime. Every day we use this disinfectant in the bilges, boats, hammock-nettings, water-closets, head, and around the decks. In my opinion the ship has been most effectively cleaned, so that no trace of the disease remains. We are now breaking out the hold and will have everything removed from all store-rooms, so that all parts of the ship can be thoroughly disinfected.

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REGULATIONS FOR THE MAINTENANCE OF QUARANTINE INSPECTIONS ON THE NORTHERN FRONTIER OF THE UNITED STATES.

The following circular, dated October 10th, has been issued by Surgeon-General Hamilton, U. S. Marine Hospital Service:

To the Medical Officers of the Marine Hospital Service, Customs Officers, and others concerned:

The act approved April 29, 1878, entitled "An act to prevent the introduction of contagious or infectious diseases into the United States," provides that no vessel or vehicle coming from any foreign port or country where any contagious or infectious disease exists, or any vessel or vehicle conveying persons, merchandise, or animals affected with any contagious disease, shall enter any port of the United States, or pass the boundary line between the United States and any foreign country, except in such manner as may be prescribed under said act.

Attention is now directed to the prevalence of the contagious and infectious disease of small-pox in Montreal and other places in the Dominion of Canada, and the law referred to is held to apply alike to trains of cars and other vehicles crossing the border and to vessels entering ports on the northern frontier.

Because, therefore, of the danger which attaches to the transportation of persons and baggage, and articles of merchandise, or animals, from the infected districts, the following regulations are framed, under the direction of the Secretary of the Treasury, and subject to the approval of the President, for the protection of the health of the people of the United States against the danger referred to:

1. Until further orders, all vessels arriving from ports in Canada, and trains of cars and other vehicles crossing the border line, must be examined by a medical inspector of the Marine Hospital Service before they will be allowed to enter the United States, unless provision shall have been made by State or municipal quarantine laws and regulations for such examination.

2. All persons arriving from Canada by rail or otherwise must be examined by such medical inspector before they will be allowed to enter the United States, unless provision has been made for such examination as aforesaid.

3. All persons coming from infected districts, not giving satisfactory evidence of protection against small-pox, will be prohibited from proceeding into the United States until after such period as the medical inspector, the local quarantine, or other sanitary officer duly authorized, may direct.

4. The inspectors will vaccinate all unprotected persons who desire, or are willing to submit to, vaccination free of charge. Any such person refusing to be vaccinated shall be prevented from entering the United States.

5. All baggage, clothing, and other effects, and articles of merchandise, coming from infected districts, and liable to carry infection, or suspected of being infected, will be subjected to thorough disinfection.

6. All persons showing evidence of having had small-pox or varioloid, or who exhibit a well-defined mark of recent vaccination, may be considered protected, but the wearing apparel and baggage of such protected persons who may come from infected districts, or have been exposed to infection, will be subjected to thorough disinfection as above provided.

7. Customs officers and United States medical inspectors will consult and act in conjunction with authorized State and local health authorities so far as may be practicable, and unnecessary detention of trains or other vehicles, persons, animals, baggage, or merchandise will be avoided so far as may be consistent with the prevention of the introduction of diseases dangerous to the public health into the United States.

8. Inspectors will make full weekly reports of services performed under this regulation.

9. As provided in section 5 of said act, all quarantine officers or agents acting under any State or municipal system, upon the application of the respective State or municipal authorities, are empowered to enforce the provisions of these regulations, and are hereby authorized to prevent the entrance into the United States of any vessel or vehicle, person, merchandise, or animals prohibited under the act aforesaid.

10. In the enforcement of these regulations there shall be no interference with any quarantine laws or regulations existing under or to be provided for by any State or municipal authority.

MICHIGAN.—At the regular quarterly meeting of the State Board, held in Lansing, October 13, 1885, the Secretary stated that pamphlets had been prepared and printed, by order of the Board, as follows:—"The Prevention of the Introduction of Communicable Diseases," 10,000 copies; "Permits for the Removal of Sick Persons or Infected Articles," 2,000 copies; "Prevention and Restriction of Cholera," 20,000 copies;

"Names and Addresses of Health Officers in Michigan for the years 1885–6," 1,600 copies; and "Rules" for the Health Inspection of Immigrants and Travellers," 500 copies. Beside the general distribution of a large number of documents to local health officers, clerks of townships and villages, and sanitarians, there had been sent out during the quarter about 8,000 copies of documents relating to the restriction and prevention of communicable diseases for distribution to neighbors of families in which such diseases were known or believed to be present.

The Secretary gave the details, as far as known, of the disinterring near Le Roy, Osceola Co., without authority, of a body dead from small-pox about one year, and removal to Sparta Centre. The office had warned all the health officers along the route and at either terminus, to promptly vaccinate all who had been exposed by this disinterring, reinterring, or carriage, and to isolate the parties or place under surveillance until danger of spreading small-pox was over.

There is complaint of bad odors and nuisances arising from corpses transported in Michigan. The Secretary instanced the case of the body of a woman recently taken from Hersey to Albion. Beside this undoubted nuisance, the body was suspected (although it cannot be proved) of conveying diphtheria to two young women of Albion who died of that disease. Corpses are usually carried with baggage under them or piled upon them, and it is claimed that the fluids not infrequently run out of the boxes and across the baggage-car. It seems desirable that there should be greater uniformity and care in packing bodies for transportation, even in cases where no contagious disease is suspected. In this connection, the Secretary reported that, by invitation, he attended, September 16, in Lansing, a meeting of the Michigan Association of General Baggage Agents, and took part in the discussion of the subject of the meeting.

"*The Transportation of Dead Bodies.*" At the meeting, a committee was appointed to draft "Rules" for the guidance of agents of railroad companies in the transportation of dead bodies. The chairman of that committee, Mr. H. P. Dearing, the General Baggage Agent of the Michigan Central Railroad, appeared before the Board, and presented the Rules

as adopted by the committee. He said the design was to make a set of rules that would meet the views of the several State Boards of Health, and be adopted by all the great lines and railroads in the United States, so there shall be uniformity of practice, and thus better protect the lives of railroad employees and of travellers. Rule 1 absolutely prohibits the transportation of bodies dead from small-pox, Asiatic cholera, typhus fever, and yellow fever. Rule 2 provides that all other dead bodies may be transported, provided they are encased in an antiseptic interment sack, hermetically sealed, in addition to being in a coffin, and this in a tight wooden box, except those dead of diphtheria, scarlet fever, typhoid fever, erysipelas, measles, or other contagious and infectious diseases, which must be wrapped in a sheet thoroughly saturated with a strong solution of chloride of zinc—one half pound of the chloride of zinc to a gallon of water, before being incased in the hermetically-sealed sack. The coffin must be surrounded by sawdust saturated with a solution of chloride of zinc the same strength as stated above. Rule 3 specifies that no person or article that has been exposed to the infection may accompany the body. Rule 4 provides that some one must accompany the body, and forms for certificates are given. After discussion of the subject, the Board approved the rules.

The Small-pox. The Secretary stated that, while the inspection of travellers to keep out small-pox was under the direction of the United States Government, he passed through it in coming from Canada to Michigan, and examined somewhat in detail the methods employed. Since the Board took charge of the inspection, he had visited Detroit and consulted with reference to the inspection, and he had suggestions to make for its improvement. He also stated that small-pox is reported to have spread from Montreal to many cities and villages in Canada, and also to Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, New York, and Illinois; Michigan, the most exposed of any State, has so far escaped—no authentic report of a case having been received. Many pieces of baggage from Montreal have been disinfected by the Inspectors at Port Huron and Detroit, and one convalescent from small-pox has been stopped at Port Huron for disinfection of all material liable to spread the disease.

The subject of the inspection against small-pox was considered by the Board. It was decided that the rules in regard to disinfection of articles from an infected district apply to freight and cars, and to freight from infected districts arriving by boat, consigned to places in Michigan. A rule was made that no passenger car from Montreal or other infected district shall be allowed to enter the State without being properly disinfected. The Board decided to appoint one additional inspector at Port Huron and two at Detroit. It was also decided to appoint two assistant inspectors at Detroit, to act in case of necessity, because of the inability of the regular inspectors, but that no extra expense should be incurred on account of them. Mortimer Willson, M.D., of Port Huron, was appointed additional inspector at that place.

The Secretary was directed to get into communication with as many lumbering camps in Michigan as possible; to send them pamphlets giving best methods for the restriction and prevention of small-pox by vaccination, isolation, and disinfection, to urge the importance of the vaccination of the employees, and to assist them in procuring virus. It was also suggested as advisable that lumbering contractors should not employ unvaccinated persons. A resolution was passed to the effect that, in view of the fact that small-pox is now prevalent in towns and cities in Canada in direct communication with this State, all health authorities be requested to encourage vaccination of citizens in their respective townships, cities, and villages. A letter from Dr. A. E. Bacon, health officer of Sault Ste. Marie, was read, in which he states the exposed condition of that village to small-pox. The Board decided that the appropriation would not warrant the payment of inspectors outside of Detroit and Port Huron; but in order to co-operate with the local Board so far as possible, authorized the health officer of Sault Ste. Marie to act as inspector under the State Board without pay from the State.

The present year has been a particularly trying one for the office of the Secretary of the Board. Early in the year, at a time when extra work was needed, he was harassed by false reports of investigations, and extraordinary demands upon the office have since been continuous, because of the fearful plagues of cholera in Europe and small-pox in Canada, besides the in-

creasing demands by local boards of health and others throughout the State for aid, in efforts to control the preventable diseases most destructive in Michigan—diphtheria, scarlet fever, and typhoid fever. However, in addition to such work, arrangements have been made and two sanitary conventions have been held, the one at Ypsilanti having been especially successful; and the State inspection of travel to keep out small-pox has been established. Sickness in Michigan has been much less than in former years. The next regular meeting of the Board will be on the second Tuesday in January, 1886.

Inspectors of Travel.—The Board having taken prompt action, on the occurrence of the Canada epidemic, for the prevention of the introduction of small-pox into the State, on the assumption of this service by the Treasury Department of the United States, under date of October 21, 1885, the inspectors of travel were instructed as follows:

"GENTLEMEN: The State Health Inspection Service, established by the Board under Act No. 230, Laws of Michigan, 1885, will cease immediately; in accordance with a letter this day received from Governor Alger, in which he says: 'Of course, however, the State Board will not discharge these officials until the [United States] Government takes the matter up.'

"By request of the Governor, I have informed Dr. H. W. Sautelle, United States Marine Hospital Service, Detroit, Mich., that 'this State will take no further action in the matter.'

"I understand that the reason for this is that the Governor considers that the 'Regulations for the Maintenance of Quarantine Inspections on the Northern Frontier of the United States,' issued by the Treasury Department of the United States (Department No. 153), and approved by the President of the United States, is applicable in Michigan as well as in other States, and that the United States Government should maintain the inspection in Michigan as well as in other States.

"In closing, permit me to thank you for your efficiency. During your service, no small-pox has entered Michigan, so far as known; but it has been reported to have been conveyed from Montreal, by person or otherwise, to Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, New York,

Pennsylvania, Illinois, and Wisconsin. The most exposed of any State, Michigan, has so far escaped.

"HENRY B. BAKER, Secretary."

DENVER, COL.—The *Tribune-Republican* reports: There were 89 deaths in this city during August, which shows a death-rate of 1.58 per 1,000 upon a basis of 56,000 inhabitants. Considering August an average month, the report would indicate an annual death-rate of 18.96 per 1,000.

The greatest number of deaths from any one disease was from phthisis; .15 of the deaths are attributed to diseases of this character. But, except in exceedingly rare instances, phthisis does not originate in Denver. Persons affected with it come here from the East in the hope of regaining their health. Many of them recover, but it is also true that many die. The climate of Denver is not responsible for these deaths; and, to correctly show the healthfulness of the city, cases of phthisis should not be counted in making an estimate of the death-rate of Denver.

Deducting the cases of death caused by phthisis, and those due to accidents, the number that occurred in August was 71, for which Denver may justly be considered responsible. This number shows a death-rate per 1,000 for the month of 1.268; and, again taking August as an average month, this would indicate an annual death-rate of only 15.21 per 1,000.

This is probably too favorable a showing for Denver, for there is naturally less liability to disease during August than during the cold months of winter and early spring. Nevertheless, the rate is remarkably low. If we take the rate of 18.96 per 1,000, it shows a much more healthful condition than Chicago, Boston, Philadelphia, and New York.

The report also shows a remarkable absence of diseases of a choleraic type. There was only 1 death from cholera infantum, and 1 from cholera morbus. The probabilities are that the latter was due to indiscretion in eating and drinking. The comparative freedom of Denver from diseases of this character is largely due to the purity of both the air and the water. People who drink nothing but artesian water, and breathe the pure dry air of this city, are not in much danger from attacks of any diseases resembling cholera.

REPORT OF THE COMMITTEE OF THE CITIZENS' ASSOCIATION ON THE MAIN DRAINAGE AND WATER-SUPPLY OF CHICAGO is a pamphlet of thirty-two pages, describing the difficulties, and discussing means of relief from the dangers which now beset Chicago on account of deficient drainage and water pollution. It is sincerely to be hoped that the circulation of this pamphlet will have the effect of speedily arousing the people of Chicago to a sense of their danger and the necessity of prompt action.

THE COST OF THE PLYMOUTH EPIDEMIC OF TYPHOID FEVER.—The cost of sanitation is the most common objection by those who have not been so unfortunate as to incur the cost of its neglect, as in the case of the Plymouth epidemic. This, according to the Philadelphia *Ledger*, is about as follows: The price of lives was 107; there is no way to equate that money. The cost in dollars was nearly sixty thousand dollars in extra expenditure, and about the same sum in loss of wages from enforced idleness among the sick and those who had to wait upon and nurse the sick; in all about *one hundred and twenty thousand dollars*. Costly experience certainly for a town so small as Plymouth. But will the people there profit by it, or elsewhere profit by the example?

VITAL STATISTICS OF IMMIGRATION.

NAMES OF STEAMERS, DATE OF ARRIVAL, PORT OF DEPARTURE, NUMBER OF PASSENGERS, NUMBER OF DEATHS AND BIRTHS DURING THE VOYAGE FROM EUROPEAN PORTS TO NEW YORK, FOR THE MONTH OF OCTOBER, 1885.

Arrival.	Vessels.	From.	Passengers.	Deaths.	Births.
Oct.	1, Pennland,	Antwerp,	346		2
"	1, Main,	Bremen,	875		1
"	2, Germanic,	Liverpool,	811	1	
"	2, Elbe,	Bremen,	864	1	
"	3, Polynesia,	Hamburg,	294	1	1
"	8, State of Georgia,	Glasgow,	214		1
"	17, Wieland,	Hamburg,	431		1
"	20, Australia,	"	273		1
"	21, Canada,	Havre,	227	1	1
"	23, City of Chester,	Liverpool,	544	1	1
"	26, Polaria,	Hamburg,	311		2
"	26, Ethiopia,	Glasgow,	169		1
"	26, Rhaetia,	Hamburg,	755	1	1
"	31, Neckar,	Bremen,	781		1
			6,895	6	14

MORTALITY STATISTICS IN THE UNITED STATES.

MONTH OF SEPTEMBER, 1885. Correspondents under this head will please send reports promptly.	Total Deaths.	Deaths under 5 years.	Lung Diseases.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Fevers.	Small-pox.	Diarrhœal Diseases.	Annual rate per 1,000.
Lowell, Mass., 64,051	...	...	...	..	..	..	..	..	..	..	....
‖Worcester, Mass., 68,383	24	4	2	2	..	..	..	1	..	1	18.2
Providence, R. I., 117,607	163	48	40	4	2	1	6	9	..	17	16.6
New Haven, Ct., 78,000	104	30	19	8	..	..	..	7	..	18	16.0
New York, N. Y., 1,397,395	2,647	1,163	653	135	4	5	56	107	5	384	22.7
Brooklyn, N. Y., 665,602	1,126	521	253	55	17	..	17	48	..	165	20.8
Hempstead, N. Y., 18,160	12	5	4	..	..	..	1	1	..	2	8.0
Albany, N. Y., 95,000	180	65	35	34	1	..	2	7	..	11	22.5
Yonkers, N. Y., 22,000	31	13	5	..	..	..	1	..	..	7	16.9
Cohoes, N. Y., 20,000	12	4	2	..	1	..	..	2	..	2	7.2
Troy, N. Y., 60,000	107	42	28	1	..	..	1	14	..	23	21.4
Syracuse, N. Y., 65,000	93	26	19	..	..	..	..	5	..	12	17.1
Utica, N. Y., 39,000	42	8	11	2	..	..	6	..	..	4	12.8
Auburn, N. Y., 26,000	26	5	8	..	..	..	..	1	..	4	12.0
West Troy, N. Y., 13,000	26	7	4	2	..	..	..	1	..	4	23.8
Rochester, N. Y., 101,000	152	48	34	12	5	..	..	5	..	11	18.0
Kingston, N. Y., 20,000	28	14	2	3	1	1	..	1	..	4	15.9
Newburg, N. Y., 20,000	8	5	5	3	..	..	..	2	..	..	15.0
Poughkeepsie, N. Y., 20,207	23	4	6	..	..	..	..	1	..	1	13.6
Oswego, N. Y., 24,000	24	12	3	..	..	..	..	..	..	6	12.0
Lockport, N. Y., 16,000	20	...	7	..	..	..	..	1	..	1	15.0
Binghamton, N. Y., 20,000	16	1	3	..	..	..	1	1	..	..	9.6
Elmira, N. Y., 25,000	34	9	3	..	..	..	..	1	..	1	11.5
Hudson Co., N. J., 213,000	449	226	94	23	4	1	9	16	..	31	22.4
Paterson, N. J., 63,287	83	38	16	5	..	..	..	2	..	8	15.7
*Philadelphia, Pa., 949,432	1,483	628	251	92	4	1	14	93	..	104	15.7
*Pittsburg, Pa., 180,000	308	141	54	26	12	1	9	28	..	..	20.0
Erie, Pa., 36,000	30	14	3	..	..	..	1	3	..	5	10.0
Wilmington, Del., 53,500	92	38	17	2	..	..	1	6	..	..	20.4
Cincinnati, O., 325,000	...	...	...	..	..	..	..	..	..	..	....
Toledo, O., 52,000	...	...	...	..	..	..	..	..	..	..	....
Detroit, Mich., 165,000	301	71	45	29	2	..	4	20	..	30	22.1
*Rock Island, Ill., 11,650	8	4	2	1	..	..	..	1	..	1	7.1
Chicago, Ill., 630,000	1,044	490	169	103	20	1	3	104	..	96	19.8
St. Louis, Mo., 400,000	...	...	...	..	..	..	..	..	..	..	....
Milwaukee, Wis., 160,000	242	83	31	18	3	2	..	5	..	35	18.1
San Francisco, Cal., 235,000	415	116	81	18	..	1	1	13	..	21	21.1
Minneapolis, Minn., 129,200	115	15	18	11	2	..	2	16	..	13	10.6
St. Paul, Minn., 111,394	131	91	14	7	2	..	1	9	..	20	13.2
*Baltimore, Md., 408,520	597	247	101	51	1	1	11	42	..	60	18.6
†Dist. of Columbia, 200,000	251	94	54	11	2	..	4	33	..	23	21.7
Richmond, Va., 75,000	135	58	24	1	1	..	2	3	..	7	21.6
§Lynchburg, Va., 23,000	20	10	2	..	..	..	..	3	..	2	18.0
New Orleans, La., 234,000	467	...	92	6	1	..	4	53	1	25	28.9
Nashville, Tenn., 50,000	90	36	15	7	..	..	..	4	..	15	17.9
Mobile, Ala., 31,295	86	27	12	1	..	..	..	18	..	2	32.8
Savannah, Ga.	...	...	...	..	..	..	..	..	..	..	....

*4 weeks; †3 weeks; §2 weeks; ‖1 week.

MORTALITY STATISTICS ABROAD.

FOUR WEEKS ENDING SEPTEMBER 26, 1885.	Total Deaths.	Deaths under 1 year.	Bronchitis and Pneumonia.	Diphtheria and Croup.	Scarlatina.	Measles.	Whooping-cough.	Typhoid and Typhus Fevers.	Cholera.	Diarrhœal Diseases.	Annual rate per 1,000.
London, 4,083,928.....	4,771	1,209	522	128	65	100	120	44	5	272	15.2
Liverpool, 579,724.....	1,102	238	...	8	15	32	25	27	..	80	22.5
Glasgow, 517,941.....	330	202	118	19	29	5	27	14	..	69	20.7
Birmingham, 427,769...	509	167	...	5	3	5	7	4	..	67	15.5
Dublin, 353,082.....	640	156	93	2	11	2	9	14	..	52	23.4
Manchester, 337,342....	582	176	...	1	4	19	7	1	..	63	22.5
Leeds, 333,139.....	430	140	...	1	11	1	6	6	..	41	16.8
Sheffield, 305,716.....	442	167	...	..	7	3	6	8	..	41	18.8
Edinburgh, 246,703....	286	70	27	6	2	..	4	4	..	19	14.8
Belfast, 219,222.....	382	76	65	2	9	3	10	4	..	21	22.4
Bradford, 214,481.....	253	61	...	2	3	1	1	2	..	12	15.4
Hull, 168,292.....	197	49	...	..	3	..	2	5	..	14	13.8
Newcastle, 153,209.....	255	59	...	2	5	7	2	5	..	12	21.7
*Havre, 105,867.....	191	80	11	1	..	1	2	6	..	48	31.3
Rheims, 93,823.....	264	89	14	3	..	32	6	20	..	64	32 9
Nancy, 76,358.....	141	33	10	..	1	3	1	11	..	16	31.8
Breslau, 295,000.....	592	215	36	25	2	..	6	5	..	70	24.2
Brussels, 175,811.....	331	94	32	7	1	..	6	2	..	80	23.7
Cologne, 153,500.....	263	103	18	5	3	..	2	1	..	42	22.2
Christiania, 126,000....	186	49	17	28	13	..	4	2	..	22	18.8
ONE WEEK ENDING SEPTEMBER 19, 1885.											
Frankfort, 147,900.....	61	32	1	1	1	..	..	..	..	8	21.4
Hanover, 135,400.....	49	8	6	2	1	..	..	..	..	3	18.8
Bremen, 121,550.....	45	12	2	..	1	..	..	1	..	2	19.3
Dantzic, 119,240.....	64	27	1	4	..	4	..	2	..	16	27.9
Stuttgart, 110,918.....	34	12	3	4	..	..	..	..	..	1	16.1
Strasbourg, 110,789....	55	26	2	3	..	..	..	1	..	6	25.4
Dusseldorf, 110,033....	55	27	4	..	..	..	..	1	..	3	26.0
Nuremburg, 107,132....	44	11	6	1	..	..	..	..	..	3	21 4
Chemnitz, 106,163.....	56	28	1	3	1	..	..	1	..	4	27.4
Magdeburg, 109,000....	54	22	9	3	..	..	..	1	..	2	25.8
Elberfeld, 103,200.....	27	14	...	..	..	..	..	..	..	3	13.6
Barmen, 102,000.....	27	5	4	1	3	..	..	..	..	1	13.8
Altona, 98,550.....	49	17	2	6	4	..	..	1	..	5	25.9
Aix-la-Chapelle, 90,300.	38	15	1	..	1	..	..	..	..	4	21.9
Mayence, 65,000.....	31	8	3	1	3	5	..	1	..	1	24.8
Amsterdam, 361,314....	120	...	...	4	3	..	2	..	..	...	17.0
Rotterdam, 166,001....	48	...	...	1	2	..	..	..	..	1	14.7
The Hague, 134,552....	44	...	...	..	..	..	4	..	..	...	17.0
Lyons, 376,613.....	....	...	...	..	..	..	..	..	..	...	....
Berlin, 1,263,455.....	537	190	41	34	17	2	..	7	..	29	22.1
Hamburg, 497,956	249	110	13	14	4	..	4	..	..	39	26.0
Dresden, 241,500.....	105	43	10	4	2	..	..	1	..	8	23.6
Munich, 244,000.....	130	57	7	4	1	..	1	..	..	29	27.7
Leipzig, 168,976.....	46	17	7	2	2	1	..	..	..	1	14.2
Königsburg, 157,660 ...	56	16	1	3	..	..	..	1	..	4	18.5
Bucharest, 200,000.....	96	32	15	7	6	2	..	3	..	8	25.5
Paris, 2,239,928.....	775	134	40	20	5	10	4	23	.	106	18.0
†Calcutta, 433,219	228	...	...	..	..	..	..	77	14	26	27.4

* 3 weeks; † week ending August 22.

OBITUARY.

RICHARD MCSHERRY, M.D., of Baltimore, Md., died at his home in that city, October 7, 1885. He was born in Martinsburg, Va., November 21, 1817. Was educated at Georgetown College, University of Maryland, and the University of Pennsylvania. He graduated M.D. from the last-named institution in 1841; soon thereafter he entered the medical corps of the Army. He served under General Taylor in the Seminole War, and in 1843 resigned his commission in the Army, and in the same year was appointed an Assistant Surgeon in the Navy, in which he served nine years, meanwhile being promoted to Passed Assistant Surgeon. On his resignation from the Navy, in 1851, he settled in Baltimore, where he soon became established as an accomplished practitioner, and identified as one of the leaders in the medical profession. He was one of the founders, and the first president, of the Baltimore Academy of Medicine. He was also an active member of the Medico-Chirurgical Faculty of Maryland. In 1862 he was appointed Professor of Materia Medica in the University of Maryland; and in 1865 Professor of the Principles and Practice of Medicine in the same institution, which professorship he held up to the time of his death.

Dr. McSherry was an accomplished writer—social, political, and professional. "El Puchero; or, A Mixed Dish from Mexico," 1850, was a clever campaign sketch, and a capital presentation of the then condition of Mexico. In 1869 he gave to the press a volume of essays and lectures, literary and medical, somewhat after the style of Dr. John Brown's "Spare Hours." In 1879 his "Health and How to Promote It," was published by the Appletons:—this is one of the most useful and practical works on sanitation hitherto published in this country—it has already passed to a second edition, and will doubtless long continue to be a popular hand-book for amateurs and medical students. Besides these works, he has been a liberal contributor to the medical periodicals of Baltimore; and his views on whatever subject he presented always attracted the attention of the profession.

It was the privilege and pleasure of the Editor of THE SANITARIAN to have known Dr. McSherry somewhat intimately, as friend and correspondent, for about thirty years. As a scholar, pure-minded Christian gentleman, and congenial companion, he had few equals and no superiors. Those who knew him best loved him most.

The following tribute to his memory from the *Maryland Medical Journal*, October 17th, will be cordially shared by all whose privilege it was to know him:

"A special meeting of the Medical and Chirurgical Faculty of Maryland was held on October 10th, to take action in regard to the death of Professor McSherry. The meeting was called to order by the President, Dr. John R. Quinan, who made the following eulogistic remarks:

"'*Gentlemen of the Faculty:* Without being privileged to claim an intimacy with our late distinguished colleague for as long a period as some of you enjoyed, yet I have known him sufficiently to have acquired a profound respect for his talents as a physician, and a loving regard and admiration for him as a man.

"'My first acquaintance with him began twenty-seven years ago, when I met him at my father's (whose family physician he was), in attendance on my brother. I am also myself indebted to him for his skilful and kind attention to me during sickness, and since my removal to Baltimore, in 1869, I have had frequent occasion for his professional aid and counsel, and every interview has only deepened my appreciation of his talents, skill, and worth.

"'In a cooler mood, and with feelings less agitated by a sense of our recent loss, I should take interest in tracing his long and brilliant professional career—from the time he sailed in the Constitution, and gathered his varied observations of disease in every country and clime, to the day when he followed the fortunes of General Taylor through the Everglades of Florida, and again Scott, to his bloody but triumphant march to the city of Mexico—the record of which he has embraced in "El Puchero," a book that can still be read by lay and professional readers with profit and pleasure.

"'Again, we would like to follow him into his civil practice, and eminently successful pursuit of his profession in Balti-

more from 1851 till his death. We would recall the solid wisdom of his instruction in the Chairs of Materia Medica and of Practice in the Maryland University, and the dignity with which he graced the highest office in your gift, the Presidency of this venerable Faculty; but I leave this portraiture to another occasion, and to some abler hand. Enough for us to-day to feel assured (as all must do who knew him), that his biographer, however critical, will find his subject faithful to his trust, in every position he has filled, and entitled to the verdict, which is but the echo of our own hearts to-day, "Well done, good and faithful servant." To-day, my feelings prompt me rather to dwell on his virtues as a man; on those individual traits of character that endeared him most to those who knew him best.

"'Inheriting the blood of the Calverts on the one side, and the stern principles and fervid patriotism of a Revolutionary sire on the other (for I am a full believer in the inheritance of both mental and physical qualities), he seemed to unite, in his own character and manners, the gentle courtesy of the one ancestor, with the courage and unflinching firmness of the other. He was truly a brave Christian gentleman, a very Bayard, "without fear and without reproach," and recalled to me Wordsworth's portrait of the "Happy Warrior,"

> "'"Who doomed to go in company with Pain
> And Fear and Bloodshed—melancholy train—
> Turns his necessity to glorious gain,
> More skilful in self-knowledge, even more pure
> As tempted more; more able to endure
> As more exposed to suffering and distress,
> Thence also more alive to tenderness;
> But who, if he be called upon to face
> Some awful moment to which Heaven has joined
> Great issues, good or bad for humankind,
> Is happy as a lover, and attired
> With sudden brightness as a man inspired,
> And through the heat of conflict keeps the law
> In calmness made, and sees what he foresaw.
> He who, though thus endued as with a sense
> And faculty for storm and turbulence,
> Is yet a soul whose master bias leans
> To homefelt pleasures and gentle scenes,
> Who while the mortal mist is gathering, draws
> His breath in confidence of Heaven's applause."

"'Such was our friend, and to his name we pay the willing homage of our hearts to-day. Brothers, if we cannot claim his talents, let us emulate the example of his virtues and his life.'

"'On motion, a committee of five was appointed to draft resolutions and to report at this meeting.

"'The committee, consisting of the following gentlemen, Drs. S. C. Chew, C. Johnston, F. E. Chatard, Jr., Thomas Latimer, and Thomas Murdoch, presented the resolutions, which were offered by Dr. S. C. Chew in the following words:

"'*Mr. President and Gentlemen of the Faculty:* In presenting the resolutions prepared by your committee, I desire to say a few brief words prompted by the relations of close personal friendship which existed for many years between Dr. McSherry and myself. These relations have now become memories, and all the more valued and cherished memories from the fact that they were a transmitted heritage, the continuation of a long and cordial intimacy between Dr. McSherry and his immediate predecessor in the Chair of Practice of Medicine in the University of Maryland, my father. It was my privilege and my pleasure to know Dr. McSherry very thoroughly, both in professional and personal intercourse. As a physician he was distinguished by the quality of judiciousness, which made him a good and safe practitioner. He was eminently conservative; and while always willing to give fair trial to whatever of new might come with good credentials, yet he never allowed himself to be swayed either as to methods of practice or the use of individual agents by those waves of medical opinion which so often show to the educated intelligence that they are transitory and delusive. As there are many present who will agree with me in this estimate of his professional abilities, so there are some whose opportunities of knowing him were such that they can confirm my statement that, as to his personal character, Dr. McSherry was among the best of men. He was eminently a pure-minded and a charitable man. In my long acquaintance with him I never knew him to entertain a sentiment or utter a word of unkindness toward any one. Through life he was governed in all his dealings by a truly Christian spirit, and his acceptance of Christianity was not only an intellectual conviction of its truth; it was that, as I know from very many conversations with him

upon the subject, but it was something more than that. It was the guiding, actuating principle of his life, and he furnished another illustration of the truth which has been set forth by the examples of many noble members of our profession, by Laennec, by Trousseau, by Cruveilhier, by Paget, by Clark, and by a multitude of others, that there is no antagonism between the spirit that is occupied with the truth of physical science and the spirit which bows submissively and adoringly before the throne of God.

"'Your committee would offer the following resolutions:

"'*Resolved*, That the Medical and Chirurgical Faculty of Maryland, assembled to take action in regard to the death of their late fellow-member and former President, Dr. Richard McSherry, are profoundly conscious of the loss sustained by themselves as a Faculty, by the medical profession, and by the whole community.

"'They would express their deep appreciation of those endowments and qualities of Dr. McSherry which made him a judicious and conscientious practitioner, a wise and able counsellor of his professional brethren, a valued and beloved friend.

"'While lamenting that he has been removed from the sphere of his faithful labors, they recognize the fact that the calm and peace of his closing hours were the fitting end of his well-spent and noble life.'

"Remarks of Professor Christopher Johnston in seconding the resolutions:

"'*Mr. President:* In seconding the resolutions of your committee, I cannot allow the occasion to pass without giving expression to the deep sorrow which fills my heart at the loss of our distinguished, revered, and beloved brother and colleague, Professor Richard McSherry. He is gone; we see no more his venerable form and kindly face, but the example of his virtues will endure as long as memory holds her seat.

"'It was my privilege to have enjoyed the acquaintance and friendship of Dr. McSherry for about twenty-five years, a period equal to the length of life of many gentlemen here present to-day. In all that time I had constant opportunities for observing his earnestness and assiduity, his ability as a

practitioner and as a teacher of medicine, the vigor of his mind, the variety of his attainments, the fidelity of his friendships, and the scorn with which he regarded all that is equivocal or base. I also was familiar with the directness of his action and the uprightness of his character, with the simplicity and dignity of his demeanor, and the wisdom and purity of his life. Thus the picture that I have sketched corresponds with that drawn by the mover of the resolutions before you, and you must feel that it is correct; but, if I should add anything to what I have said concerning our deceased brother, I would apply to him one of the most beautiful of the beatitudes: "Blessed are the pure in heart: for they shall see God."'

"Dr. W. C. Van Bibber's remarks:

"'In advocating the passage of these resolutions which have been offered, Mr. President and my brethren, permit me to say that, although they well express our feelings for the moment, yet the death of an old and tried friend, like Dr. Richard McSherry, brings other feelings which words alone cannot express.

"'We were reminded by the reverend orator at the altar yesterday, that nothing which can be done by us here can in any way affect him now.

"'In the religious view which he took at the interment of his remains, we can pray for his immortal soul, and this I trust we have done, and will continue to do; but for ourselves, individually and collectively, as in this society, of the interests of which he was always an ardent promoter, we may be benefited and strengthened in our lives by holding up a mirror before him as he walked among us. And whilst looking upon it, let me describe briefly some of the reflections to be seen there, and some of the impressions which his life has left with us.

"'Dr. McSherry was not an ordinary man, and his friends will ever delight to dwell upon his memory. Fresh as that memory is now, and vivid in our midst upon this floor, let me endeavor to engrave it deeper into the minds, and to lay an humble flower upon his grave which will bloom before us as long as we may live.

"'If we do not cherish the memory of our good and great

men, our society will be recreant to its intention and loose in its interest.

"'My first acquaintance with Dr. McSherry was nearly two-score years gone by, and since that time but few weeks have passed in which we did not see each other in some way or other. I now feel the void, and, no doubt as many of you do, feel as if strength was taken from us, and that honor, professional aid, and co-operation had been removed.

"'It is not given to all men to dazzle others with achievements which a few do accomplish. It is not the lot of all to leave behind them a fame which spreads wide and long. Neither can every man truly say, or absolutely believe, that his particular profession or calling in life, whatever that may be, has been materially and wonderfully advanced by his labors; but of Dr. McSherry it may be said that both in professional and private life his teaching was for true advancement, and his example manly and ennobling.

"'As a teacher of medical science, both public and private, he taught no original error for individual advancement, nor claimed knowledge which he did not possess. But in teaching those students who were intrusted to his care, he was careful in selecting his subjects, and always advocated industry and the training of the mind for future useful study. He taught no false doctrine knowingly, but had a talent for sifting the good from the bad, the useful from the worthless, the practical from the impracticable, the genuine from the fictitious. In his own particular branch he excelled in reconciling the differences amongst authors upon disputed points, and delighted to show his pupils the most prominent points and parts in the diagnosis of disease.

"'So plain and exact was he as a teacher, so conscientious and painstaking, that his lectures sometimes lost in interest and brilliancy, when, even by some equivocation, he might have made them more attractive and remarkable.

"'If these were some of Dr. McSherry's distinguishing marks as a public and private professional teacher, the example he has left us in private life is yet more prominent. He was a man upright and honest, and always to be depended upon, and never to be doubted. One whose aim was for good, and never for evil, whose happiness was to contemplate virtue and

to reprove vice. He was one whom we shall all miss, and for whom we shall ever grieve, but whose life and example it will always be a pleasure and an advantage to us to recollect.'

"Professor W. T. Howard's remarks:

"'*Mr. President:* I cannot permit this solemn scene to pass away without laying an humble leaf upon the bier of my late eminent colleague and warmly cherished friend. For eight years we taught in the same school of medicine, and I have had numerous opportunities to know him well. Always and everywhere he was the *model gentleman*, high above all chicanery and tricks in and out of the profession, open-hearted and open-handed. In the wide field of his usefulness and toils he had few equals among us. Of vast and varied opportunities for observation and study over nearly the whole civilized world, he had acquired an immense amount of valuable information, not only in his chosen profession, but in general literature and scientific culture. As a friend he was true and firm under every trial, and his genial smile and his intellectual face will long irradiate the memories of all who knew him well and enjoyed his confidence. His life was a beauty to behold and a blessing to regret.'

"Dr. T. A. Ashby's remarks:

"'*Mr. President:* I desire to add my humble tribute of respect to the memory of Professor McSherry, and to endorse the beautiful and appropriate words and sentiments which have been expressed by the gentlemen who have preceded me. My acquaintance with Professor McSherry began soon after I came to this city as a student of medicine, and when I was entirely without friends and acquaintances in the medical profession of Baltimore. He soon became my warm and generous friend, and I enjoyed his friendship until the day of his death. He freely gave me his advice and counsel in all matters of professional duty, and in many other of the relations of life. I learned to love him devotedly, and in his death I feel that I have lost a friend in deed and a friend in truth.'"

LITERARY NOTICES.

A TREATISE ON EPIDEMIC CHOLERA AND ALLIED DISEASES. By A. B. Palmer, M.D., LL.D., Professor of Pathology, Practice of Medicine, and Clinical Medicine in the College of Medicine and Surgery in the University of Michigan; author of a work on "The Science and Practice of Medicine," etc. 12mo, pp. 224, $1. Ann Arbor, Mich.: Register Publishing House.

This is a practical work of importance to all medical practitioners, giving the results of extended observation and sound experience with regard to the mode of propagation, treatment, and restriction of cholera; fortified by a collation of testimony from others who, like the author himself, have not allowed themselves to be carried away by Koch's or others' theories formed in advance of facts. In the general history, symptomatology, and prophylaxis of cholera, with which more than half of the volume is taken up, it is in accord with generally accepted doctrines. Remedies of all kinds, which had been used at one time or another in the treatment, are briefly discussed, as a preface to the author's own views, which are of a positive, and by no means expectant, character. The indication being to allay irritation and arrest the discharges, such remedies are required as are known to be efficacious for the purposes; but, to be so, they must be used with the utmost promptitude from the time of attack. "Opium, in proper doses and combinations, in the earlier stages, before the vital powers are much exhausted, and while irritation of the stomach and bowels is the most prominent symptom, is *the great remedy* in the disease." Quinine, coffee, mustard, ammonia, capsicum, camphor, valerian, cassia, and the bromides, as means of regulating and sustaining nervous action, fall in as adjuncts; and, to excite the liver to its natural secretion, calomel should be given in repeated doses. With relation to essential cause, the germinal origin is accepted, subject to reproduction without as well as within the body, and to dis-

semination through the atmosphere, and consequent liability to inhalation and propagation by this means as well as through the alimentary canal by water or food; and, moreover, to multiplication in, and dissemination from, filthy surroundings. While the author's opinions are of a decided character, the opinions of those who differ from him are fairly given, together with such a summary of the literature on the subject as are of interest to all medical practitioners.

INDEX CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE, UNITED STATES ARMY: "Authors and Subjects," Vol. VI., HEARTIE–INSFELT. 4to, pp. 1,051. J. S. Billings, Surgeon, U.S.A. Washington: Government Print.

"This volume includes 7,900 author-titles, representing 2,543 volumes and 7,250 pamphlets. It also includes 14,590 subject-titles of separate books and pamphlets, and 75,290 titles of articles in periodicals." It is gotten up in the same excellent style as the preceding volumes.

A TREATISE ON DIPHTHERIA, HISTORICALLY AND PRACTICALLY CONSIDERED; INCLUDING CROUP AND TRACHEOTOMY, fully illustrated, is announced by the enterprising publishers, J. H. Chambers & Co., St. Louis, by A. Sanné; Translated, Annotated, and the Surgical Anatomy added, by Professor Henry Z. Gill, A.M., M.D., LL.D., etc., of Cleveland.—It hardly seems necessary to state that the reputation of both of the authors is such that the highest expectations may be indulged by the profession for the excellence of the work.

HEALTH STATISTICS OF WOMEN COLLEGE GRADUATES: Report of a Special Committee of the Association of Collegiate Alumnæ, Annie G. Howes, Chairman. Together with Statistical Tables, collated by the Massachusetts Bureau of Labor. Pp. 78. Boston: Wright & Potter Printing Co.

Referring briefly to the elaborate tables which have been prepared, it appears: That the graduates are largely of American parentage. The average age at which they began study at entering college was 18.35 years, and the average present age is 28.58 years. During college life the majority studied but moderately, and only 44 per cent. did not worry

over their studies or affairs. Since graduation all seem to have found congenial occupation, a great many as teachers, while eight only are occupied with social duties to the exclusion of other occupations. Somewhat over one-fourth have married, and of the whole number of children born by them the greater part are living and in good health. On entering college 78.16 per cent. were in good, 1.98 per cent. in fair, and 19.86 in poor health. Since graduation the percentages are 77.89, 5.11, and 17.02 respectively. In other words, 138 report a deterioration in health, 418 have had no change, and 149 show an improvement in health. The bureau, in concluding the report, says: "The facts which we have presented would seem to warrant the assertion that the seeking of a college education on the part of woman does not in itself necessarily entail a loss of health or serious impairment of the vital forces."

ABNORMAL POSITIONS OF THE HEAD and LITTLE THINGS are the respective titles of two lectures, by Edward Borck, A.M., M.D., Professor of Surgery, etc., St. Louis, Mo.—A pamphlet of fourteen pages, to which is appended a "Memorandum of Dr. Edward Borck's Contributions toward Medical and Surgical Literature."

PUBLIC HYGIENE AND STATE MEDICINE: Report of Committee to the Medical Society of California, April, 1885, by M. M. Chipman, M.D., Chairman of the Committee.—A pamphlet of seventeen pages, concisely stating the relations of municipal filth to cholera and other infectious diseases; sewage irrigations, and other means of sewage and detritus disposal; the mischief arising from quacks and quack-medicine advertising, and other banes in conflict with the public health, which deserves something more than the execration of all decent people in California and everywhere else.

OVER-PRESSURE IN SCHOOLS, and SANITARY SCIENCE AND PUBLIC HYGIENE, by W. S. Robertson, A.M., M.D., President of the Iowa State Board of Health; and LIGHTING AND HEATING SCHOOL-HOUSES, DEFECTS AND REMEDIES, by L. F. Andrews, Acting Secretary of the State Board of Health of Iowa, are the respective titles of three ex-

cellent contributions to, and reprints from, the third Biennial Report of the Iowa State Board of Health. They well deserve the most extensive circulation that can be given them.

MILK ANALYSIS AND INFANT FEEDING: A practical treatise on the examination of human and cow's milk, cream, condensed milk, etc., and directions as to the diet of young infants. By ARTHUR V. MEIGS, M.D., Physician to the Pennsylvania Hospital and to the Children's Hospital; Fellow of the College of Physicians of Philadelphia, etc. 12mo, pp. 102, price $1. Philadelphia: P. Blakiston, Son & Co.

The room for this book will be appreciated by all students of the subject, on account of the differences of opinion among writers and analysts on the properties, qualities, and effects of milk foods, which have given rise to extensive heterogeneous notions and compounds to supplant milk foods to the manifest increase of infant mortality. With a thoroughly cultivated knowledge of all the progress made in a strictly scientific investigation of the subject hitherto, and a keen appreciation of the mischief done by unscientific speculators on infant life, the author proceeds with a directness of detail in the method of analysis and statement of differences in human and cow's milk which have every appearance of being at least unequivocal and approximately certain in their results. With due allowance for variations due to different specimens, the end sought for as the result of analysis is to acquire a correct and exact idea of the average composition of the substance analyzed. The times of feeding, proportions of food, mixtures, modes of preparation, quantity, etc., suited to different ages of infants and children, are also stated with clearness and precision, well adapted to the comprehension of intelligent mothers and nurses, as well as physicians, to all of whom we commend it as one of the very best books on the subject of infant feeding hitherto published.

WILLARD'S HOTEL, WASHINGTON, D. C.—The place of meeting of the AMERICAN PUBLIC HEALTH ASSOCIATION, December 8th to 11th proximo, affords excellences of hotel accommodation, as well as conveniences for the Association, unsurpassed by any other hostelry in the city.

THE SANITARIAN.

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CONTAGIOUS DISEASES PROPAGATED BY RAGS, AND THE NECESSITY OF DISINFECTION.

By WILLIAM M. SMITH, M.D., Health Officer of the Port of New York.

HEALTH DEPARTMENT, No. 301 MOTT STREET,
NEW YORK, October 16, 1885.

THE Sanitary Committee submitted a report upon the communication of the Health Officer of the Port on the subject of "Contagious Diseases Propagated by Rags," which was approved, and on motion the following preamble and resolution were adopted:

Whereas, The Health Officer of the Port of New York has communicated to this board much valuable information on the subject of "The Propagation of Disease by Rags;" therefore

Resolved, That the communication be published in the *City Record.*

COMMUNICATION FROM THE HEALTH OFFICER OF THE PORT OF NEW YORK TO THE NEW YORK CITY BOARD OF HEALTH.

The association of the Health Officer of the Port with the New York City Board of Health, as an ex-officio member thereof, as provided by law, was designed to promote the efficiency of the respective departments in the protection of the public health. The co-operation of these departments, through an exchange of views and a knowledge of the meas-

ures adopted by each for the protection of the public health, will doubtless contribute in the future, as it has in the past, to secure that very desirable result. For this reason, it is believed to be a duty, and it is esteemed a privilege, to present to the board a brief history of the measures adopted by the Health Officer of the Port of New York to secure the disinfection of the foreign rags that enter the port of New York, and the reasons for such action, which include the views of eminent sanitarians of this country and Europe, and the presentation of some of the evidence collected from reliable sources that infected old rags are not infrequently the source of contagious and infectious disease in this and other countries.

The Health Officer has had the honor to communicate to this board informally, frequently during his connection with it, the efforts made to secure the protection of our seaboard and interior populations from small-pox, by securing early vaccination of the immigrant after leaving the port of departure, and greater vigilance on the part of the medical officers of passenger steamers in detecting the incipient development of contagious disease among them on the passage; the effort to secure the removal of hospitals from the steerage and the covered gangways to such places on the steamer as would afford complete isolation of the sick, and the measures to secure an improved hygiene of passenger steamers have, from time to time, been informally laid before your board.

The disinfection of rags at the port of New York has been also frequently discussed. The necessity for this is not a new one to the sanitarians of other countries; but, long and earnestly as it has been discussed by them, the practical difficulty has been that no means has been discovered by which rags in bale could be efficiently disinfected. Moist heat, dry heat, boiling and sulphurous acid, one or the other, have been suggested by many, and employed by a few, to disinfect rags before they were baled, but it was reserved for Yankee ingenuity to discover the means by which superheated steam and sulphurous acid in vacuum could be used to penetrate quickly the largest and most closely packed bale of rags; and by the use of the first-named agent destroy with certainty the most resisting forms of germ life, and with the second, all except spore-bearing organisms.

The presentation of this subject to the members of this board—its history, the opinions of health authorities and sanitarians, and the facts are designed to aid in securing the expression of an intelligent opinion from the humanitarians who stand upon the watch-towers that overlook the public health, as well as from those whose duty it is, as the chosen guardians of the public health, to "cry aloud and spare not" when dangers, great or small, near or remote, threaten to invade the charge which it is their duty to preserve.

If, on the other hand, the leading minds among sanitarians and health authorities believe that the disinfection of old rags is necessary, the expression of a concurrence of such views will doubtless be received by those who are legally constituted supervisors of maritime sanitation with respectful consideration.

The succeeding pages of this article will convince all impartial minds who give them attentive perusal that the rule which requires that all old rags should be disinfected before they are shipped, or at the port of New York, has been made in compliance with the expressed conviction by influential sanitary and health organizations of the necessity of such a regulation.

The discussion among European sanitarians and health authorities as to the means by which this object can be accomplished has taken a wide range. In 1884, Dr. Ruysch, of The Hague, proposed to disinfect rags before baling by "steam or hot air;" "as to disinfecting them in a lump (bale), I fear," he wrote, "it will be a difficult matter." Dr. George Buchanan, of the "Local Government Board" of England, in his report for 1883–4, was of the opinion that "bales of rags cannot usually be properly disinfected," "without exposure to heat in such a way that every article in the bale shall attain a temperature of 250° Fahr." "The arrangement," he continues, "which gives greatest penetration of heat is the use of high-pressure steam," "or the bale may be opened out, and the whole of its contents be exposed to disinfection by a liquid agent, and this may be water at a boiling heat, or water containing one pint of the clear solution of chloride of lime to four gallons of water," in which the rags "should soak for some hours." Dr. Proust, the French delegate to the Inter-

national Sanitary Conference at Rome, writes as follows, under date of August 22, 1885: "Our intention now, in France, is to subject them (rags) to the action of disinfecting tanks by means of steam, and while those tanks or boilers are being constructed to subject rags to the action of sulphurous acid." Dr. Rochefort, Secretary of the Marine Board of Health (France), in the *Revue d'Hygiene*, vol. vii., No. 7, describes "an apparatus for steam disinfection," of which, in conclusion, he says: "If this apparatus does not solve in a complete manner the problem of disinfection, it brings at least an important addition to the solution sought." Dr. Pouchet, in the *Revue d'Hygiene* of May 20, 1885, describes an apparatus for the disinfection of rags, by MM. Lecouteux and Garnier in St. Oberkauff, as "a copper boiler, in which the rags are piled up, and which is provided with a double bottom pierced with holes, and having at the bottom part a cock for the escape of water. The lid is cemented and bolted on the boiler, and has a cock for the introduction of steam. The apparatus once well closed, a jet of steam is introduced under pressure of three atmospheres into the boilerful of rags."

The *Annales d'Hygiene Publique*, 1879, vol. ii., p. 480, has the following: "But in this question (the disinfection of rags) it is necessary, as much as possible, to consider the interests of public health with those of commerce, and we judge that the previous disinfection of rags by heat is the process to be generally adopted, but to add thereto disinfecting vapors in special cases. The action of heat is prompt, almost immediate, which constitutes an economy of time, and heat alters neither the merchandise nor its color, which is very important for the rag trade. We cannot speak too often of it. It is urgent to establish large apparatus for disinfection by heat in our lazarettos; those destined for our hospital and beneficiary establishments would be of lesser importance. This apparatus is indispensable in order to treat the rags coming from abroad, as well as to cleanse those which are received in the interior of the country."

The disinfection of Egyptian rags by boiling has been practised by the Seymour Paper Company, at their warehouses in Cairo, for nearly two years past. The use of sulphurous acid, with the rags well scattered upon racks, was also recommended

to this company by the Health Officer at New York, with the expressed preference for the disinfection by boiling, on account of the liability of the rags to be packed so closely and piled in such quantities upon the racks as to prevent the access of the gas to them sufficiently to effect a satisfactory disinfection.

The system of disinfection of rags in bale by superheated steam, in use at the port of New York, has the misfortune, for its popularity with rag importers, of being patented. The disinfection in bale by the "sulphur vacuum process," so far as the details of the experiments have been received, seems likely to be satisfactory, and will doubtless afford to those importers who are prejudiced against disinfection by superheated steam the opportunity of employing a rival system of disinfection.

In relation to the regulation which requires that all rags shall be disinfected that enter this port, it is proper to say that the importance of the rag industry is not overlooked in the restrictions on the importations of this article which have been thought necessary for the public health.

More than a quarter of a million of people in France alone live by this industry. Probably 175,000 bales of rags enter per annum at the port of New York—worth several millions of dollars. But this ought not to disguise the fact that old rags have in all time past been considered as prolific sources of contagion. And the more the subject is discussed, the more will this be apparent. It will be seen, now that the discussion is invited, that this fear among health authorities is neither new nor groundless.

While seeking to discharge a duty, conceived to be such by the light of long and patient investigation, and by the expressed opinion of sanitary organizations and health authorities, it has not seemed proper to increase public apprehension in relation to a useful article of commerce by representing the dangers from the omission of the duty, which would be likely to increase the prejudice or fear of the public. For this reason no public reply has been made to the criticisms of interested parties until they impliedly, if not expressly, charged venality in the discharge of the duty.

An appeal was made from the decision of the Health Officer, which requires that all foreign rags entering this port

shall be disinfected where gathered or at this port. The parties making the appeal have the satisfaction—the distinction, if they please to consider it such—of being the first in the experience of something more than five years, during which interests aggregating thousands of millions of dollars have passed under the supervision and control of the New York Quarantine, to express a doubt of the integrity which has influenced the measures and management of it, and to appeal from the decisions made by the Health Officer in the official discharge of his duty.

A brief history of the circumstances which led to the adoption of the present restrictions on the importation of old rags will be necessary to an intelligent presentation of the reasons for the Health Officer's refusal to give permission to land the cargo of Italian rags on the Fillippo, from which decision D. de Castro recently made an appeal.

The causes which have contributed to impress health authorities, not only in this country, but in Europe, that old rags have been fruitful sources of the dissemination of some forms of contagious disease, will be referred to farther on as briefly as is consistent with the many proofs at hand of that fact.

A literature has not been wanting in relation to this article of commerce, which inspired the liveliest apprehension in the minds of a great majority of the people of the danger of the introduction of contagious diseases among the populations of our seaboard and interior communities by the admission of foreign rags. The press, in numerous instances and throughout the country, disseminated this literature in language more vigorous than elegant. "Old rags picked from the filth of Egyptian towns like Cairo and Alexandria—rags gathered from the slums of Naples—old rags that were thrown into the street from hospitals and pest-houses," were held up to the public gaze as the embodiment of filth and the greatest source of danger to the public health.

During the winter of 1883–4, the writer had formulated a plan for boiling Egyptian rags at the warehouses of the Seymour Paper Company, in Cairo and Alexandria, which was adopted, and a plant made for that purpose, the supervison of which was intrusted to a citizen of the United States appointed by the Secretary of State. This plan of disinfection pro-

ceeded for some time, and twelve to fifteen thousand pounds were daily disinfected.

The extension of cholera to the continent of Europe, it is assumed, seemed to the Government to necessitate the adoption of this or other measures to prevent the importation of infected rags from those localities, as the restriction on the importation of rags not disinfected amounted practically to an embargo. A circular issued by the Treasury Department, August 30th, prohibited the landing of old rags on and after September 1st, prox., for three months from the date, and charged customs officers throughout the United States with the execution of the order. Subsequently this order was modified to the extent of admitting all rags afloat previous to September 1st, and afterward the order was farther modified so as to allow rags that were afloat previous to January 1, 1885, to enter our ports, and prohibiting the entry of old rags that were not afloat on that date from any foreign country, except upon disinfection at the expense of the importers.

JUDGMENT OF THE STATE BOARDS OF HEALTH CONFERENCE.

At the conference of the representatives of State boards of health, and of maritime sanitary officials, held at Washington, D. C., December 10 and 11, 1884, the Secretary of the Treasury requested and obtained the expression of the views of the conference in respect to the admission of rags from foreign countries; for there was a difference of opinion manifested between the Secretary of the Treasury and the Secretary of State in this matter, as shown when the matter was discussed at the Cabinet meeting held the day previous to the meeting of the conference; the Secretary of State was understood to favor the prohibition of the importation of all foreign rags, while the Secretary of the Treasury inclined to admit rags if disinfected by some process which health authorities considered efficient.

The views of the conference, as represented by the committee to whom the subject was referred, were expressed in the following letter to the Secretary:

WASHINGTON, D. C., December 11, 1884.

To the Hon. HUGH MCCULLOCH, *Secretary of the Treasury:*

SIR—The committee appointed by the Conference of State Boards of Health to consider the subject of national action re-

lating to health, which committee had the honor of an interview with you this day, hereby respectfully submits the view of the committee respecting the particular source of danger to health upon which you have expressed a wish to receive the opinion of the committee, namely, from imported rags.

Members of the committee believe that contagious diseases, dangerous to the public health, occur in the homes of the people in every country; that old rags are collected mainly from cast-off material from the homes of the people, and that old rags, in whatever country collected, are not free from danger; and that it would tend to prevent the introduction into this country of more than one contagious disease if all old rags so imported into the country should be disinfected before or on entrance at the port of entry.

This committee are of the opinion that disinfection of old rags can be effected by boiling them thoroughly, by exposing them to superheated steam so as to assure a temperature equal to or exceeding two hundred and twelve degrees, by the use of sulphurous acid gas—the rags being fully exposed to the action of such gas in the ratio resulting from the burning of two pounds of sulphur to each one thousand cubic feet of air, or by the use of the latter agent in any other form or manner which shall secure the subjection of the old rags to that agent in an effectual manner.

This committee further expresses the opinion, that the disinfection of rags should be allowed to be effected in any country where a proper inspection of the process of disinfection can be secured, and such disinfection certified to by a representative of the United States.

H. B. WALCOT, *Chairman.*
S. S. HERRICK, *Secretary.*

Ten days subsequently, December 22d, Secretary McCulloch issued the following circular:

To Collectors of Customs and others:

All circulars of the department concerning the importation of old rags are modified as follows:

No old rags, except those afloat on or before January 1, 1885, on vessels bound directly to the United States, shall be landed in the United States from any vessel, nor come into the

United States by land, from any foreign country, except upon disinfection, at the expense of the importers, as provided in this circular, or as may hereafter be provided.

Either of the following processes will be considered a satisfactory method of disinfection of old rags, and will entitle them to entry and to be landed in the United States upon the usual permit of the local health officer, viz. :

1. Boiling in water for two hours under a pressure of fifty pounds per square inch.

2. Boiling in water for four hours without pressure.

3. Subjection to the action of confined sulphurous acid gas for six hours, burning one and a half or two pounds roll-brimstone in each one thousand cubic feet of space, with rags well scattered on racks.

4. Disinfection in the bale by means of perforated screws or tubes through which sulphur dioxide, or superheated steam at a temperature of not less than three hundred and thirty degrees, shall be forced under a pressure of four atmospheres for a period sufficient to insure thorough disinfection.

Old rags may be landed and stored at such places as may be approved by this department, for the purpose of undergoing any of the processes of disinfection before named, and upon the completion of such process to the satisfaction of an inspector of customs and the local officer the rags may be delivered to the importer or consignee.

Old rags may be subjected to disinfection by either of said processes in any other country where this department may appoint an inspector to superintend the same, whose certificate of such disinfection shall be authenticated by a United States consular officer, according to Department Circular No. 61, of April 22, 1884. H. MCCULLOCH, *Secretary.*

The Secretary of the Treasury forwarded this circular to health authorities and to importers of rags, asking their opinion of it.

COMPARATIVE VALUE OF SUPERHEATED STEAM AND SULPHUROUS ACID AS DISINFECTANTS.

The first three processes above mentioned is the formula for the disinfection of Egyptian rags in the latter part of 1883.

The fourth process mentioned in the circular, to wit, disinfection in the bale by means of perforated screws or tubes, through which sulphur dioxide, or superheated steam at a temperature of not less than three hundred and thirty degrees, was forced, was as novel an expedient as it has been proved to be efficient—at least in subjecting the rags to the agents mentioned in the department circular.

The history of the adoption by the Treasury Department of the system of disinfection of rags in the bale by superheated steam, while not strictly pertinent to the objects of this article, is nevertheless a necessary portion of this subject, since it affords an explanation and justification of the action of the Health Officer in accepting the method adopted by the Government for the disinfection of rags in the bale.

In the latter part of December, 1884, the Secretary of the Treasury requested the Health Officer of the Port of New York to indicate some suitable place near New York City or Brooklyn for disinfecting rags from foreign ports. Before complying with this request, a consultation with Dr. Raymond, Health Commissioner of Brooklyn, was held in relation to the disinfection of rags, and it was determined that the efficiency of superheated steam and sulphurous acid should be submitted to such tests as would afford a practical demonstration of the power of those agents as germicides. Dr. J. S. Billings, of the United States Army, was requested to conduct the experiments. He declined, and recommended that Dr. George M. Sternberg, also of the United States Army, but on detached duty at the Johns Hopkins University, be employed, as his specialty in the cultivation and study of disease-producing germs would enable him to give satisfactory attention to the tests it was proposed to make.

The results of the tests with superheated steam were communicated by Dr. Sternberg, under date of February 24th, as follows:

"Moist heat proves to be a most certain and practicable method of destroying germs, and the most resistant spores are quickly destroyed by a temperature of 230° Fahr., which is 100° below the temperature exacted by the Treasury Department. The spores of anthrax are destroyed by a temperature of 221° maintained for two minutes, and all micrococci and

bacilli not containing spores are quickly destroyed by a temperature much below the boiling-point of water."

The management and result of the experiments with sulphurous acid is best told by Dr. Sternberg's report, in the *Medical News* of March 14 and 28, 1885. It is sufficient to say that the report of Dr. Sternberg indicated a less satisfactory result with that agent than was secured with superheated steam.

There is no doubt that whatever of living organisms may exist in bales of rags, including the most resisting spores, may be quickly destroyed by steam at a temperature of 230° Fahr., and that all parts of a bale weighing half a ton may be heated to this degree in eight minutes by the system adopted.

The conclusions in respect to SO_2 have not in all respects been as satisfactory, but it was conclusively proved that the specific infecting power of vaccine virus is destroyed by it; and that micro-organisms without spores may be destroyed by this agent, if exposed to it under favorable circumstances.

The Baltic Stores, on the water-front of South Brooklyn, were designated by the Secretary of the Treasury as the place for the disinfection of "old rags" by superheated steam, subject to the approval of the local health authorities.

Under date of June 10, 1885, the Treasury Department issued a circular relegating to the local health boards and quarantine officials the regulations under which foreign rags should be admitted. The plant for disinfecting rags was removed from the Baltic Stores soon after this order was issued, and established near the discharging quarantine anchorage.

The recommendation of the conference of eminent health authorities which met at Washington, D. C., December 10, 11, 1884, that all foreign rags should be disinfected in countries where gathered, or at the ports of entry in this country, and the adoption by the Government of that recommendation, constitutes one of the reasons for requiring that all old rags entering the port of New York shall be disinfected.

Early in April of the present year, the undersigned was apprehensive that cholera would appear in Europe, and, impressed with the great responsibility of the situation which was imposed, owing to the epidemic of cholera in Europe during the past year, and the liability that the dreaded disease would

recruit its forces during the present season and cross the Atlantic to invade our own people, as also with the conviction that other contagia, particularly that of small-pox, which existed in an unusual degree in some localities, notably in London, where an average of from 1,200 to 1,500 cases of that disease were in the hospitals for the past year, the writer invited a conference of the principal maritime, sanitary, and local health officials, which met at the Fifth Avenue Hotel, April 23d, and adopted the following conclusions:

1. That the maximum period of incubation of Asiatic cholera may, for quarantine purposes, be assumed to be eight days; and that, in case of the disease occurring on vessels during the voyage hitherward, the quarantine of observation of persons should extend to eight days from the last date of possible exposure.

2. That, for fumigation of closed spaces, sulphurous acid gas may be commended, from two to three pounds of sulphur being burned for each one thousand cubic feet.

3. That, for disinfection of luggage, or other fomites, reliance may be placed on fresh chloride of lime, bichloride of mercury, or dry heat to 230° Fahr.

4. That, in view of the danger of other contagia, as well as that of cholera, all rags imported to this country should be disinfected either at the place of departure or on their arrival here.

5. That, if such disinfection be done abroad, it be required that either the rags be boiled for not less than thirty minutes, and dried before baling, or treated with superheated steam for not less than eight minutes, and in such manner as to be heated to or above two hundred and twelve degrees Fahr. in every part.

6. That inspectors should be appointed (by the department having control of the epidemic fund) to certify to the sufficiency of disinfection of rags according to the above rules, and that a consular indorsement be added to such certificate.

7. That, in the absence of such certificate and consular indorsement, all rags should be disinfected at the port of entry.

These conclusions, which were not invited by the Health Officer at the port of New York, but which were the expres-

sion of the deliberate and unbiassed judgment of the sanitarians present, and which were subsequently formally approved by others not present at the meeting, affords another of the reasons for requiring that all foreign rags entering the port of New York shall be disinfected at the port of departure or at this port.

The appeal of De Castro & Co. was based upon the claim that an exception should be made in his case to the regulation which has been adopted under the advice of one of the most numerous and representative health conferences ever held in the United States, and subsequently by the representatives of most of the principal quarantine officials of the Northern Atlantic ports. The Health Officer at New York, for the two years previous to the order of the Government which directed that all foreign rags should be disinfected, endeavored to make these exceptions, and found it to be far the most difficult and vexatious of the duties of his administration.

The eminent Dr. Richter, of Germany, whose voice was long since raised against rags as the fruitful source of contagious disease, says: "When man's own interests are at stake, he does not care at all for his fellow-beings, whether in adversity or prosperity, and for a farthing he will put all the people's health in jeopardy."

This is severe language, but it is the language of one of the most earnest and eminent of the sanitarians in Europe.

It is but a few weeks since a small invoice of rags came to this port by one of the English steamers. The Health Officer at New York was notified by the consul at Naples that these rags came from one of the worst cholera-infected portions of that city. The Health Officer telegraphed the agents of the steamer in New York that the rags would not be permitted to land. The consignees of these rags did not come forward to claim them. Is there any doubt that they would have done so if the source from which they came had not been discovered?

Dr. Sternberg, of the United States Army, writes as follows, under a recent date:

"It cannot be claimed that it is necessary, in order that the public health may be protected, to disinfect all rags which come to us from foreign ports. But it is so difficult a matter to determine just what rags may be admitted with safety, that

it seems to me advisable to make the rule general. If exceptions are made, and the matter is left to the judgment of the local health authorities, the carelessness or indifference of a single individual may neutralize all the good which has been accomplished by judicious discrimination and disinfection at all our principal seaports. The chain is no stronger than its weakest link."

Dr. J. Higham Hill, Health Inspector on the Consular Staff at London, writes, under date of August 19, 1884, to the Consul-General: "I have heard that large quantities of continental rags are now being forwarded to America via Hull rather than London, there being no health inspector at the former port.

"The sources whence rags are collected are so difficult to trace, and, during epidemics of infectious disease, rags are so likely to come from infected localities, it appears to me that, unless a reliable certificate from a competent authority be produced, stating that they have been properly disinfected, it would be a wise precaution to prohibit the importation."

Consul Lathrop, at Bristol, on the same date, wrote the State Department that rags arriving in England are not required by the "Local Government Board" to be disinfected if designed for immediate exportation, and adds: "Under this provision it would be entirely competent for a vessel direct from Marseilles, for instance, to transship its cargo of rags at any English port for the United States."

WHY ALL FOREIGN RAGS SHOULD BE DISINFECTED.

The above are some, but not all, the reasons why there should be no exceptions to the rule under present circumstances. I hasten to notice some of the circumstances which have contributed to impress the Health Officer at New York with the conviction that the line of safety and assurance of protection of the public health lay in requiring the disinfection of all rags that enter the port:

1st. The difficulty which has been illustrated, and which is corroborated by those who have superior opportunities for observation, and thereby forming correct conclusions in determining what rags may and what may not be safely admitted without disinfection.

2d. That the precautionary measures necessary against the diseases communicated by rags have engaged the attention, and have been earnestly discussed, not only in this country, but in Europe, as instanced by the health congress within a few years past at Turin, at Brussels, and at The Hague.

3d. That the following authentic record of instances where contagious diseases have been communicated from rags afford conclusive proof of the wise regard which the representative bodies referred to in this country and Europe have for the public health, in the prohibition recommended of the distribution of rags that have not been disinfected.

The *British Medical Journal* of May 11, 1878, p. 686, speaks of "rags as disseminators of disease," and refers to "the measures taken by the Austrian Government to prevent the spread of disease by obtaining the adoption of uniform precautions in all the neighboring States, in the shape of strict enforcement of sanitary regulations and the prohibition of the importation of rags." "The authorities of Austria," the article remarks, "have for some time forbidden the importation of rags."

Vol. i., p. 863, of the same journal, says: "An epidemic of small-pox, which spread somewhat widely, broke out at Abenheim, in the Canton of Worms, Rhenish Hesse. Almost all the patients at the outset were five women, who worked in a rag-factory cutting up and assorting rags. The cases were investigated, and it was found that a portion of these rags came from Marseilles, where small-pox prevailed to a serious extent."

The *British Medical Journal* of July 3, 1880, vol. i., p. 21, says: "Girls who worked at storing rags, at Canterbury, contracted the disease and communicated it to twelve others." "The then health officer said that during the period of three years there had not been a case of small-pox in the city the origin of which had not been traced to the factory." In 1878 cases originated in the same factory. In 1879 another case occurred there. Dr. Butterfield, in his last annual report on the health of Bradford, wrote: "No case of small-pox had occurred in the borough for many months, when a girl who had not left the neighborhood was taken sick. In a few days another young woman employed in the same work exhibited

symptoms of the disease." "March, 1878, several persons, residing apart, but working in the same room at a rag warehouse, were simultaneously affected with small-pox, and from them extended to about thirty others."

"At Whittlesford, in 1873 and 1875, there were two outbreaks of small-pox from the same cause." "At Thetford an epidémic of six months' duration, and from which sixteen or seventeen deaths resulted, were traced by Dr. H. J. Hunter to two women engaged together in cutting up some foreign rags, and who fell ill the same day."

Under date of January 20, 1883, the *British Medical Journal* said: "An outbreak of small-pox has just taken place at New Cathcart under peculiar circumstances. A local firm of paper-makers received, in December last, a quantity of rags from Königsberg, via Leith. The work-people in their employment have been engaged in cutting them up recently, and within the last few days four of them have been seized with small-pox, and some others have sickened with what is feared will turn out to be the same disease."

The Thirteenth Annual Report of the Local Government Board (of England, 1883–84) contains the following, in the report of the medical officer of the board:

"Of infectious diseases, which are known to have been conveyed to persons engaged in the rag trade or in paper-making, small-pox is by far the most frequent;" . . . and again he remarks: "It has been thought desirable to take exceptional precautions to prevent the introduction of cholera by them (rags) into English ports."

The restrictions on the importation of rags at the port of New York are by no means without precedent. Reference has been made to the restrictions by Austria. Holland has a very rigid inspection law. And a French decree, dated as early as March 15, 1879, compels "all rags imported into France by sea to be disinfected; and the importation of rags is restricted to certain ports where disinfecting apparatus have been provided."

In order to evade this, rags have been unloaded at neighboring ports in other countries, and thence carried by land across the frontier. With a view of preventing this, it has been recommended that the importation be restricted on land to

places where a disinfecting arrangement is provided. (See *British Medical Journal* of August 4, 1883.)

The following is from the *British Medical Journal* of May 2, 1885:

"The Woodside Rag Works, at Aberdeen, the outbreak of small-pox amongst the workers in which was the subject of a question by Dr. Farquharson, on April 23d, have repeatedly been the scene of similar outbreaks of the same disease, and it would be worth while, therefore, that some special inquiry should be made as to the precautions adopted by the proprietors for preventing such occurrences in future.

"Some of the better known paper-makers in England have now a regular set of regulations for minimizing the danger arising from the handling of infected rags. It is impossible, perhaps, absolutely to prevent the occurrence of a case of small-pox from this cause, without measures of disinfection being applied to all rags. Although we have no reason for assuming that other diseases are not spread by rags, we have chiefly records of small-pox distributed in this way." . .

Section 49 of the Scotch Public Health Act of 1867 (corresponding to Section 125 of the English act of 1875) imposes a penalty on any person who "gives, lends, sells, transmits, or exposes, without due disinfection, any bedding, clothing, rags, or other things which have been exposed to infection from any dangerous infectious disorders." Of course, if this law were universally observed, the question of rag disinfection would hardly arise, at any rate as regards rags of home origin. If infected rags pass into the hands of dealers, it is not because the law is not sufficiently stringent, but because of the practical difficulties in the way of its enforcement.

Obviously, it is the person who first sells the rags who should be responsible for their freedom from infectious properties, both because he alone is likely to know their history, and because if disinfection were postponed until they reached the paper-mills, the rags would pass through several hands while still retaining their infectious properties. It would seem hardly fair, therefore, to compel the paper-manufacturer to atone for the omissions of the first vender by a process of disinfection applied indiscriminately to all rags; but it would nevertheless be very desirable if, for the protection of the

work-people, paper-makers could see their way to the adoption of some effective means of disinfection of rags. Of the processes which have been proposed to this end, Dr. Franklin Parsons, to whose admirable summary of the subject we are indebted for many of the above suggestions, thinks that high-pressure steam seems to promise most.

The belief that old rags communicated contagion is so considerable in England that it has been the subject of discussion in the House of Commons.

British Medical Journal, August 25, 1883, p. 397: "House of Commons, August 15, 1883. Importation of Disease by Rags. Sir S. Northcote asked the President of the Local Government Board whether his attention had been called to some cases of small-pox reported from a place in his constituency, which were supposed to have originated from foreign rags among people employed in certain paper-mills.

"There was one death last week, and there had been several other serious cases of illness. He called the attention of the Local Government Board to the subject, in the hope that some restriction might be devised to check the propagation of infection by rags."

It will doubtless be admitted that cholera and other severe forms of contagious diseases, such as small-pox, diphtheria, scarlatina, and typhus fever, can be communicated by cast-off or soiled clothing; but old rags, it is said, have no such history as carriers of contagion. It is urged that rags are gathered months before being shipped, and the contagion, if there was any, has lost its power. This is probably true of a great portion of the rags imported, but it is certainly true that there are in most, if not all, consignments rags that have been recently gathered. And it is also true that the contagion of some of these diseases may be preserved in clothing and old rags for weeks and months, and when again exposed to the air, in the presence of susceptible persons, will communicate their deadly poison. It has never been satisfactorily ascertained how long the contagion of some of these diseases may be retained in old rags or cast-off clothing. The cases of small-pox that developed in 1873, in the hospital at Utrecht, were traced to insufficiently disinfected bed-quilts which had been infected by small-pox patients treated there in 1872.

The *British Medical Journal* of 1880, vol. i., p. 952, has a report by Dr. Henry S. Alford, Medical Health Officer in the Tauton District, in relation to the Abenheim epidemic of small-pox, in which he alleges that the disease was communicated by "rags that had been on the premises six months, and were obtained from Russia or Wales." No cases had occurred in the village, nor had the girls first attacked left home.

Dr. Ruysch, of The Hague, one of the delegates to the International Sanitary Congress at Rome, of the present year, and one of the most earnest, able, and zealous of the European sanitarians, made a report to the Congress of Hygiene at The Hague, in 1884, on rags—"A Danger National and International"—from which the following extracts are made:

"In England, France, and Germany the same facts go to prove the propagation of diseases, and principally small-pox (by rags). One of the most interesting works on this subject is certainly Dr. Gilbert's report on the epidemic at Marseilles, that had exactly the same characteristics as the small-pox epidemic of 1874 and 1875, and proved conclusively the great influence of rags on epidemics. To cite only two facts: In 1874 there were 117 rag stores in Marseilles, of which 46 were in one district; in that district the number of dead from small-pox was three times larger than in any other district, while of 157 cases of disease, 64 cases occurred in rag-pickers' houses, or in houses in close proximity thereto, or rag stores. In that district Dr. Gilbert found a cellar for rags which infected six persons, four of whom died."

"A rag-picker from Amsterdam, when cholera was raging in 1866, introduced it in the city of Tilburg."

"At Dresden a rag-picker was the first victim of cholera in that commune."

"At Mearssen the first one attacked with cholera was a rag-picker."

"In 1866, various people working in a paper-mill at Wormerveer had been handling rags, and were taken with typhus."

"The origin of the small-pox epidemic in 1871, at Herde and Epe, the medical inspector attributed to rags."

"In 1870, and in 1880, persons were attacked with small-pox, who, while working in a paper-factory at Maestricht, had

been handling rags, or had visited the localitv where rags are selected; whereas during all that time no other case of this disease was known at Maestricht, but only in Belgium, whence the suspected rags were partly coming."

"Infected rags from Marseilles caused an epidemic at Abenheim, in Germany."

"Similar reports on the propagation of small-pox by means of rags have been established in a paper-factory at Lyons, Christiana, Leipsic, Bradford, Osult, Whittlesford, and Thetford."

"As in the disposition of filth we must commence by watching the place of its origin—the gutter, the house, the sewers under our feet, and finally the place where it is accumulated—so in rags must we watch the various ways by which they come into circulation, and the stations where they are stored; and so much more so in rags, as we know by sad experience that men engaged in this business, for the sake of a few pennies, are apt to relax their obligations."

The conclusions of the report of Dr. Ruysch are embraced in the two following conclusions, which were adopted by the congress of The Hague:

"1st conclusion.—Since the disinfection of rags as practised in general leaves much that is unsatisfactory, and that the precautions to take when gathering, transporting, and selecting rags, clothing, and old clothes are not sufficient, rags that have not been carefully watched from their starting point are a national and international danger."

"2d conclusion.—To appoint a commission of the members here present in this congress to ascertain what measures, national and international, can be adopted to prevent the fatal influence communicated by this source of contagion."

The conviction that old rags from foreign ports have been and are public carriers of contagion is most firmly established in the minds, not only of the sanitarians of other countries, but of our own maritime and interior health authorities, and of those eminent sanitarians.

The relegation by the Government to the local health authorities of the question of the admission of rags left to maritime sanitary officials a legacy of difficulties, under which it has been impossible to make uniform rules for their ad-

mission at the different ports consistent with the sense of duty of those officials, as the guardians of the public health, and, secondarily (but an important duty), as the conservators of commercial interests. The following is an illustration :

The Boston Board of Health, on June 1st, adopted this order :

" In view of the unreliable character of the evidence as to the origin, history, and treatment of rags brought to this port from foreign ports, and in view also of the misleading character of the health certificates brought by masters of vessels from ports from which rags are shipped, and on account of the danger from cholera and other contagia likely to be carried by these importations, it is hereby

" *Ordered*, That on and after this date (June 1, 1885) all rags arriving at this port from any foreign port shall, before being discharged, be disinfected, under the supervision of an officer of this board and in a manner satisfactory to this board." Dated June 1, 1885.

At the same time the Health Officer at New York believed it to be his duty to admit all rags that had been disinfected under the supervision and regulations of the Treasury Department.

The Health Officer at the port of New York has hitherto admitted all invoices of rags that have been accompanied by the certificates of the inspector appointed by the Treasury Department, and indorsed by the United States Consul, that they have been disinfected according to either of the four formulæ prescribed by the Treasury Department in the circular of December 22, 1884.

RAG-PICKERS' DISEASE.

Extracts from Foreign and Home Journals. (*Annales d'Hygiene Publique*, 1879, vol. ii., p. 480.) The physicians of Lower Austria have observed recently a disease, the nature of which remains unknown, that they have only met in the paper-factories, and which they call the rag-pickers' disease (Die Handernkrankheit). The disease commences with weakness, anorexia, insomnia, vomiting, sensation of weight in the epigastrium the second day, sometimes the third; one can see

cyanosis of the lips, cheeks, nails, cold sweats, œdema of the lungs, no disturbance of the brain. Generally death is easy, excepting in cases where there is pulmonary stasis. No abdominal symptoms, no albumen in the urine. On necropsy one finds various lesions of the lungs without special character.

This is the disease Dr. Hoffman, the Austrian delegate to the Rome International Sanitary Conference, refers to on another page as "rag-sickness," and which he believes to be a "form of anthrax."

Extracts from the report of Dr. Bristow, taken from the eighth report of the medical officer of the Privy Council, pages 206-7: "Mr. Barnard, upon opening a bag of rags, noticed a disagreeable odor, and fourteen days (or therabouts) after was seized with small-pox. He recognized the same odor while the scabs were falling off. No small-pox in the vicinity previously. Saunders (a female rag-sorter) took small-pox from Temple Mills, Marlow; four others had it at nearly the same time. All five were engaged on dirty London rags. She was attacked in two weeks. No small-pox in the village at the time. Mrs. Hays says, while cutting up rags she recognized the smell of small-pox, and two or three weeks afterward she took the disease. She claims that the rags were from Tunbridge Wells, where small-pox was prevailing at the time. There was no small-pox in her neighborhood at the time. Mrs. Holland had small-pox, which she attributed to some London seconds she had been cutting up. Eight other cases broke out subsequently in the mill. There was in the neighborhood one Henry Styles, a carrier, who had the disease previously; he died of it a week or two before she took it, but he lived three-fourths of a mile away, and had no communication with her."

CHOLERA AND SMALL-POX COMMUNICATED BY CLOTHING.

"John Barnes, a laborer, had been suffering for two days from diarrhœa and cramp, when, on December 28th, he was taken ill with the symptoms of cholera and died. The next day Barnes' wife and two other persons who visited the sick man were seized with cholera, but recovered. The son of the deceased man then arrived; it appears he had been ap-

prenticed to his uncle, a shoemaker in Leeds, and that his aunt died of cholera fifteen days before, her effects having been sent to Barnes without having been washed. The trunk containing the things had been opened by Barnes in the evening, and the next day he was taken ill and died."—*Lancet*, vol. ii., p. 109.

"In 1854 cholera was not known in the county of Bedford, when it broke out in the village of Ridgmont, and eleven cases occurred, all of which were fatal. It was ascertained that the first case occurred in a man whose son had died of cholera in London a week or two before, and whose clothes were sent down to the country. The poor man unwrapped the bundle of clothes himself; he was seized with the disease and died. This case was the nucleus of the others. An instance of similar nature was reported from Lustheim, near Munich, where the first case of cholera was generated in the house of a laborer, one of whose daughters was in service at Munich. The latter sent her parents clothes belonging to a family some members of which had just died of cholera; these old clothes were at once appropriated and worn; three days afterward (September 21, 1854) the father and mother were seized with cholera and died; on the 22d and 25th other members of the family took the disease. Dr. Lebert reports the case of a man who was attacked with cholera, having worn the clothes of a person who had died of the disease two months previously.

"On the 24th of December, 1848, a woman and two children died of cholera in Suon Fields, Southwark. The clothes of the children were sent to Boston for the use of a third child living with its grandmother. The old lady and child unpacked the parcel, and both were attacked with cholera. There were no other cases in Boston until eight months afterward.

"It is well authenticated that during the epidemic in the United States, in 1873, cholera was introduced in effects of emigrants. The vessels which brought them were in perfect sanitary condition. Passengers were healthy, and remained so after landing, and until they reached Carthage, O., Crow River, Minn., and Yankton, Dak., where their goods were unpacked. At each place, within twenty hours after poison particles were liberated, the first case appeared."

If the contagion of cholera may be preserved in clothing

for weeks and months, why not in rags? From the collection of the works of the "Comite Consultatif" of Public Hygiene, Paris, 1883, vol. xii., p. 83. Council of Public Hygiene, Dr. Vallin, Reporter. (Translation.) Depot and Sorting Warehouses for Rags:

Rag-sorting is done on a vast scale in the department of Oise, particularly at Criel. The quantity of material which comes to the warehouses has a value of 1,5000,000 frances per annum. An epidemic of variola which devastated the Arrondissement, in 1877 and 1878, has been attributed by Dr. Boursier, member of the Council of Hygiene in the Arrondissement of Senlis, to the propagation of variolous virus by the rags. About July, 1878, five sorters of rags working in the warehouse at Criel were attacked with small-pox; they conveyed the disease to their relations and neighbors; their soiled clothing infected the proprietor and workers in a floating laundry. The course of the epidemic could be followed from its point of origin to twenty communes. The deaths at Criel, Montataire, and Nogent were twenty-two; in the Arrondissement, forty.

On the occasion of an application for a permit for the erection of a new sorting warehouse at Criel, Mr. Le Febvre, of Farque, Secretary of the Council at Senlis, has given very interesting details of the hygiene of the buildings for the operations of rag-sorting.

The warehouses at Senlis use between them 5,000,000 kilograms of rags. These are separated into four or five kinds by women, chiefly young girls.

Garments by chance whole are taken by the class of unmarried working people, who are destitute of resources. Others, which have been patched or worn too much, serve for wiping-cloths for the machines in factories. All white goods, linen or cotton, are destined for the paper-mills, except a slight amount of linen deducted for charpie or surgical dressings. The best is sent to English paper-mills on payment of the customs. Colored fabrics, cotton or half linen, are also the subjects of a minute classification, and the refuse is sold as waste. The rest passes to the weavers for manufacture into new fabrics.

The dust raised by this sorting is horrible and infective;

this dust contains, sometimes, virulent germs. Disinfection of the rags should be made. Some desire this to be done at the place of origin, at the place where the rag is received for transmission abroad; others demand disinfection at the place of destination, in the port of entry, which is the only practical measure for cargoes coming from the East by way of the sea. But they fear that the expense will be high for the wholesale dealer in rags, who is only a warehouse keeper, and who makes a first sorting in order to sell the different kinds to the various industries.

Of the commissioners appointed to examine the demand in question, one, Dr. Boursier, Health Officer, "believes neither in the fitness nor efficiency of measures directed against the establishments at Criel," but is a partisan of preliminary disinfection of rags in the family—a view which is entirely too Platonic—the other, the reporter, proposed the following conclusion:

The council considers that sanitary measures which some object to, and which the police might impose on families attacked with contagious diseases, would not be sufficient to preserve the sorting warehouses at Criel, which would always be in danger; that the virulent germs could be carried outside the warehouses by the workers, either in the form of dust or in the state of incubation.

That incubation could only occur in non-vaccinated or non-revaccinated persons.

That in regard to the rag-sorting warehouses at Criel, the prefect should be requested:

1st. To order a thorough washing of the floor every eight days.

2d. To order the workers to wear an over-garment, which is to be removed before going out.

3d. To permit no one to be employed in these works unless they have been vaccinated or revaccinated inside of ten years.

4th. To apply these measures to the warehouse in question.

The permit was given under the conditions here cited, which nevertheless seem insufficient.

We read in the report which they made about a small deduction from the linen rags for the manufacture of charpie and dressings. One cannot think without horror that, perhaps,

this unwashed charpie will be used to dress an amputation of the thigh in some hospital where Listerism is not used. Is not this a new reason for the definite banishment of charpie from hospital supplies, and its replacement by lit washed charpie?

New York Medical Journal, August 29, 1885. Letter from Dr. Sonderegger, President of the Swiss Aerzte Commission:

The fact in relation to rags was observed and described by Professor Biermer (living now at Breslau as Professor of Practical Medicine) and by Dr. Zehnder, Vice-Director of the Board of Health (Sanetätsrath), who were both most active at the time of the cholera in Zurich in 1867.

Kriegstetten is a small village in the Canton of Solothurn, at 80–100 kilometres distance from Zurich, not connected with this town either by water or by trade and industrial commerce.

There is a paper-mill at Kriegstetten, and a working-woman, who had to tear the rags, was attacked suddenly with cholera, and died the following day. The following days sixteen more workmen (all occupied in tearing rags) were taken sick; of these eleven died.

A careful examination showed that all of the rags went from Zurich and from cholera-houses; therefore, the whole mass of rags was disinfected by boiling. After this no case of cholera occurred. The large establishment of the paper-mill, as well as the village, remained free. I mentioned the fact in a little address to the Swiss people, which I have the honor to send you, and nobody doubted the fact or made any opposition. The fact was known everywhere in Switzerland.

State Board of Health, Michigan, 1882, Allegan County, page 393:

Dr. B. Thomson, Health Officer of Plainwell, reported on April 15, 1882, small-pox contracted while working in a paper-mill, from which three other cases originated.

Sixth Annual Report State Board of Health, Connecticut, 1883; General Report:

Small-pox, page 22.—"The disease was several times introduced by tramps, more often by emigrants brought up from New York for domestic or out-door service, and a few times by paper-rags. This is the principal danger, from the latter source, as shown by the investigation made by the board a few years ago, and perhaps the only one that is liable to occur

at any time. As New Haven is the chief port of entry for the State, and one of the three principal ports of entry for rags in the country, the chief danger will occur there. The recent action taken by the City Board of Health, requiring disinfection of rags from infected ports, is a proper safeguard, especially as Massachusetts and New York have local regulations on the subject."

Secretary's Report, page 225 :

In Manchester and Windsor Locks there were several cases (small-pox) infected from paper-rags, and in the latter place the disease broke out the second time in the same locality.

State Board of Health, Michigan, 1881. Secretary's Report. Proceedings of board, July 12, 1881 :

"Dr. Jackson mentioned the formation of a sanitary association at Pontiac, and said there was need for such effort there. He spoke of the spread of small-pox by an immigrant tramp-burglar, who communicated the disease to another prisoner. The clothing left in the pest-house was supposed to have been disinfected, having been treated for that purpose, the pest-house locked up and labelled. The clothing was stolen, however, and the disease communicated to sixteen persons by it, and the disease still farther spread by them. He said the information as to what constitutes disinfection was much needed there ; and it was owing to inefficient disinfection that the disease was conveyed by the clothing." Also, page 295—Prevention and Restriction of Small-pox :

Section 22, Rags.—"No person should handle old clothing or rags without taking precaution to prevent the spread of communicable diseases. Children should not be allowed to go near a rag-picker's collection ; nor into the rag-rooms in paper-mills or storehouses."

Fifth Annual Report, Massachusetts State Board of Health, 1877. Article headed, Health of Towns. Answer of correspondents, page 548 :

West Springfield.—"We, in common with the rest of the State, suffered from small-pox, originating in the rag-picking of one of our paper-mills, and spreading rapidly, there being no care taken to isolate the sufferers."

Connecticut State Board of Health. Fourth Annual Report, 1881 :

Section says, in report of small-pox.—"One or two instances, where paper-stock was the medium of conveying the contagion, should have been mentioned."

State Board of Health, Michigan, 1878, page 62:

"June 6, 1878, William Simonds, M.D., Health Officer of Warren Township, Macomb County, reported details of twenty-three cases of small-pox, occurring from February 1 to May 17, 1877. In some of the cases the disease was derived from clothing from the city; in some cases from the paper-mill. Of the twenty-three cases, seven died."

Annual Report State Board of Health, Wisconsin, 1882. Secretary's Report—page 53—Small-pox:

"A single case, the origin of which could not be ascertained, occurred in city of Appleton. It was conjectured that infected rags at one of the paper-mills caused the case, a relative of the patient being employed in the sorting-room of one of these establishments."

Page 58. Dr. Grasmuck, of Menasha, writes as follows:

"A case of variola was discovered here (January 21st) today; is about the sixth day of development. It had been kept hidden, and many have been exposed; the disease was probably contracted at the paper-mills."

National Board of Health, *Bulletin*, vol. i., No. 4. Washington, D. C., Saturday, May 1, 1880:

Ypsilanti, Mich.—Dr. E. Batwell, Health Officer of this town, reports to the State Board of Health two cases of small-pox, in which the contagion was ascribed to rags at the paper-mills. A girl working in a paper-mill and her brother, who was daily about the rag-room, were seized with variola at the same time. Several neighbors were exposed before the nature of the disease was made known. As soon as the State Board of Health was informed of the cases, Dr. H. B. Baker, the Secretary, visited them, and enforced the proper measures to prevent the spread of the disease.

Massachusetts State Board of Health, 1873, page 463:

Extracts from table showing cases of small-pox in the State of Massachusetts in 1872, and February, 1873, such table being made in pursuance of order passed by House of Representatives, January 21, 1873:

Cities and Towns.	No. of Cases.		Probable Source of Infection.
	1872.	Feb. 1873.	
Adams	34	..	Paper rags.
Blackstone	10	..	"
Cummington	19	..	"
Dighton	17	..	"
Fitchburg	24	1	" and Boston.
Holyoke	32	..	"
Huntington	3	..	"
Lee	14	1	"
Montgomery	6	..	"
West Boylston	1	..	"
West Springfield	12	4	"
South Hadley	8	..	" Holyoke.
Dalton	6	..	" Lee.

Second Annual Report Wisconsin State Board of Health, for the year ending December 31, 1877. Extracts from communications of correspondents by the secretary of the board:

P. 140, Menasha.—"During the year ending September, 1877, the city of Menasha was visited by an epidemic of small-pox, extending from December, 1876, to May, 1877, assuming in progress a severe form. During that period about seventy cases occurred, with a proportion of deaths of nearly one to six. From May to December several more cases were reported, but no deaths, most of the cases assuming a mild form. The epidemic originated in the paper-mills at Menah, and the cases occurring in Menasha all sprung directly or indirectly from that source. The first two cases that came under the care of a physician fell into my hands. They were young women, eighteen to twenty years of age, who had been working in one of the paper-mills at Menah, and had never been vaccinated. Had the proprietors been more thorough in enforcing vaccination among the employees, I am certain the epidemic would not have been so widespread. So late as April 26th, I attended a case that originated in one of the mills. The patient had worked there two months or more without being vaccinated."

141st page, Menah.—"Beginning in November, 1876, simultaneously in this city and Menasha, small-pox continued,

with short periods of intermission, through the winter and well into warm weather in the spring. During this time there were in this city some twenty unmistakable cases, the mortality being light; while in the neighboring city of Menasha the number of cases is estimated at sixty, with a much larger proportion of fatal cases.

"In both places the original and principal source of infection was the paper-mills.

"In view of these facts it must seem, even to the laity, as if some special legislation should be had, compelling the thorough disinfection of all paper-stock before allowing it to come to the mills for assortment."

Also, same report, page 95. Supplementary Report on Small-pox, by E. L. Griffin, M.D., of Fond du Lac, President:

In Neenah and Menasha the disease was believed to have been communicated by means of paper-rags brought from Milwaukee. There were three distinct cases in as many different families, which were reported at the same time, being three girls who were employed in sorting rags in the paper-mills. During the course of the season there were new cases from time to time, emanating from the mills. This special origin of small-pox indicates a special and peculiar danger from infectious and contagious diseases to a community in which paper-mills are located, and calls for unusual vigilance and hearty co-operation on the part of the proprietors of such establishments and the citizens.

In reply to inquiries made touching this source of danger, Dr. J. R. Barnett, of Neenah, writes:

"I have given the question of rag disinfection some thought, and in a recent communication to the secretary of the State Board of Health I advised the procuring of legislation compelling disinfection before rags can be handled in paper-mills.

"As to the particulars of such a bill I have thought but little, but there can be as little doubt as to the practicability as there is to the desirability of suitable legal restrictions upon the trade in and handling of paper-stock.

"Most of the stock used in the Neenah mills, of which there are four, turning out an aggregate product of ten or twelve

tons per day, requiring fifteen to twenty tons of rags, must of necessity come from abroad. The large cities are the depots and principal primary source of supply, because it is in the cities alone that the small economy of rag picking and saving is reduced to a science; at least, what is gathered into the 'junk' shops from the country is turned into the mass and baled up with it, sharing its various kinds and degrees of infectiveness without adding any element of safety. The bales thus sent out of the paper-mills are infernal machines for the dissemination of zymotic poisons.

"There are few cities of 100,000 inhabitants and over where small-pox is not in perennial bloom. There are consequently few consignments of rags to paper-mills that are not at the same time consignments of potential small-pox to the community possessing the mills.

"This statement is none the less true because it happens only occasionally that the mill-operatives contract the disease. The women in the rag-rooms are exposed to the danger of contagion almost every working-day of their lives, and the community is at the mercy of the chance which dooms or spares the rag-women.

"Safety for the community can be secured only in one way, namely, by the thorough disinfection of rags before they are allowed within its corporate limits. There are various ways by which the law may provide for this disinfection.

"It may provide that all warehouses for the accommodation and storage of rags shall be remote from centres of population, and that dealers shall disinfect, under established rules, before baling their rags for the jobbing market; or it may provide for disinfection by the manufacturer. Under any system, it should make the sale of infected rags an offence punishable by the severest penalty.

"It may be a question whether every incorporate city has not the power, under existing laws, to provide for its own safety, and to adopt any system of quarantine that it pleases. If cities already have this power, it is clear that special legislation will be required compelling them to use it so far as it is not used, and the proverbial tenderness of all city governments for the various industries of their respective towns makes it doubtful whether they could ever impose restrictions hamper-

ing in any degree their prosperity. The State should, therefore, remedy the neglect by such legislation as cannot be evaded."

If the suggestions of Dr. Barnett were accepted and acted on by proprietors of all such industries in the State, and an inviolable rule established, by which all operatives in such establishments should be excluded who did not present a written certificate from a competent physician giving assurance of the thorough protection of the bearer by vaccination, very much would be gained to the corporations and to the community in which they are located.

Variola caused by Infected Paper Rags, by F. B. A. Lewis, M.D. (Horr), of Watertown, N. Y. *Boston Medical and Surgical Journal*, vol. i., 1875, p. 647:

"Having read the article in the *Journal* of April 22, 1875, concerning a recent exanthema in Boston, I thought it possible that a notice of the cases of eruptive diseases which have occurred in this city during the past few weeks might not be uninteresting in connection with the above mentioned article. On the first appearance of these cases to be detailed, they were considered by me to be those of rotheln, as described by Drs. Cutting and Swan, but they terminated in an undoubted form of variola."

Ten cases are referred to by the writer, and the symptoms described at length; the writer further adds:

"Recurring to the first cases, they are supposed to have been caused by exposure to twenty bales of rags which were brought from California, ten bales having been received January 28th, and ten February 5th. These rags were sorted by twenty-one girls in one large room, seven of whom were attacked at about same date. The superintendent of the room stated to the writer that the rags were moist, and had a peculiarly disagreeable odor, and many bandages, poultices, some entire articles of underwear, stained as though from the persons of invalids, were found."

The writer has observed that the vessel bringing these rags to New York City was not quarantined; that the bales were stored with many others which were forwarded to the mills of another county, and, although made into paper, no complaint was entered. Some of the employees here who actually han-

dled the rags were not affected, while others working on other material on the opposite side of the room succumbed to the disease; and even two or three who were in other parts of the mill, but who came into the assorting-room on an errand, took the disease. About forty cases have occurred in all, and thirteen or fourteen have died. The mortality was mostly confined to those first attacked.

This attack has appeared to be very irregular or mixed, and not in any way like the ordinary form of variola, as seen by the writer in charge of your Quarantine Hospital in 1860. Had the cases been attended by a single physician, and the fact that all the patients had been employed in a paper-mill been known, possibly the disease might have been suspected earlier. But four days elapsed before notes were compared. However, no apparent harm was done by the delay.

I refrain from further comment on the case, as readers interested in the subject will see, without doubt, some instructive points in the time and mode of attack, the severity of some of the cases and the mildness of others, the strange recovery in the one and malignancy in the other. It appears also that even these hasty notes cannot fail to call the attention of the younger members of the profession to a possible source of a disease which, especially in the rural districts, brings panic among the people.

Opinions of Medical Men. From *The Medical Record*, June 20, 1885. Rags and Infectious Diseases. Editorial:

. . . "The opinion of these officers (health), and of the best health authorities generally, is that imported rags should sustain careful inspection, and, if need be, disinfection. The best method of securing a sanitary history of the rags—and that is what the ship should supply—have not been devised, and therefore, some trouble must for the present ensue. It is much wiser and more economical meanwhile to be on the safe side, and Health Officer Smith will get the hearty support of the profession and the laity if he takes firm ground in defence of the public health.

"It should be remembered that cholera is not the only danger which we must avoid. Whether it has ever been imported in rags or not, other diseases, almost as destructive, have been so conveyed."

Letter from E. Hoffmann, Austrian delegate to the International Sanitary Conference at Rome, 1885; member of Committee on Disinfectants:

"AUGUST 11, 1885.

"VERY HONORED COLLEAGUE: In reply to your highly prized letter, which I received yesterday, I report as follows:

"I hold rags which come from regions infected with cholera exceedingly dangerous, not merely because they may be soiled with cholera dejections, but especially because they hold in the interior of the bales the infectious material longer than might otherwise be possible, for the dejections, etc., dry out only slowly, and the warmth favors the growth of microscopic organisms. On the whole, there takes place in this respect the very same process which is also to be observed in single rags, where the infectious material is kept moist a longer time in the folds, or in places where it is more closely laid together, and keeps the microscopic organisms contained therein much longer in a condition to multiply.

"In Austria, whenever the cholera breaks out in another country, the importation of rags is imperatively forbidden. Special regulations about the disinfection of rags do not exist, and only general directions for disinfection are enforced.

"I, myself, would employ only heat (steam) and complete aeration. It is of the highest importance in this matter to see to it that only thoroughly dried rags are packed in bales and brought into trade. With reference to the so-called 'rag-sickness,' which, in my opinion, is a form of anthrax, and which affects especially the workers in paper-factories who open bales of rags and perform the first work upon them—sorting and cutting the rags—I have required that the rags, before their manufacture, should be treated with superheated steam, then spread upon a grating and thoroughly dried."

Dr. George M. Sternberg, whose researches and studies in relation to germ-producing diseases have secured him an enviable reputation both in this country and Europe, writes as follows:

"It is difficult to make a general rule which will be just to those engaged in importing rags, without taking any risk so far as the public health is concerned. But it seems to me that there will be less injustice in a rule to which no exceptions

are made, than in leaving the matter to the individual judgment of the health officers of our several cities. . . . I am satisfied that the below named infectious material could be transported across the Atlantic in bales of rags, without any loss of specific infectious power, viz.: articles infected by contact with patients having yellow fever, small-pox, or scarlet fever, or with the germs of anthrax (malignant pustule), symptomatic anthrax (black leg), pleuro-pneumonia of cattle, and tuberculosis. . . . When we consider the degraded condition of the rag-picker in the populous cities of Europe and Asia, and the localities in which their collections are largely made, it seems to be beyond question that infectious material of various kinds must frequently find its way into the bale of rags which is shipped to this country. I am therefore in favor of disinfection of all rags by the very simple but effective method of subjecting them to superheated steam."

The health officer of Ypsilanti, Mich., in a report to the secretary of the State Board of Health of Michigan, says:

"Before closing this report, I would desire briefly to allude to the source of the small-pox in this city. In most all cases it has been directly traced to those engaged in picking over rags in our paper-mills. The larger portion of those rags, particularly the best linen 'stock,' are imported in bales from France, Italy, or Germany. One can easily imagine that we have here a never-failing source of contagion, and that these rags, collected from all sources—hospitals, pest-houses, etc.—form a germ from which many of our epidemics originate. . . . Cannot some remedy be devised, or some means be introduced, to disinfect these rags previous to sending them on their mission of death and disease through the United States?"

This was written in 1876. It cannot therefore be claimed that this opinion is the result of recent discussions concerning old rags or from "cholera scare."

In reference to the last case of small-pox reported from Ypsilanti, the secretary of the Michigan State Board of Health says:

"It originated in the rag-room of one of the paper-mills, and proved fatal the third day after the eruption appeared. I am very confident that contagious diseases may be spread in this

way. Scarlet fever is frequently reported in this office as contracted from old clothing disused for weeks or months, but previously in contact with the sick."

If clothing that has been in contact with the sick may convey the contagion of scarlet fever after "weeks or months," it is much more probable that this disease, or small-pox, the contagion of which may be carried thousands of miles, and infect months after it has been given off by its victim, may be communicated by the rags which are thrown out of the sick-room into the garbage barrel or into the street, and gathered by the rag-picker with as little scruple and care from the gutters that reek with filth, as from the refuse from the residence of the rich.

Dr. T. C. Minor, whilom health officer of Cincinnati, recently addressed the following letter to the *Commercial Gazette* of that city:

"The day is not far distant when Congress must enact a law absolutely prohibiting the importation of rags, unless in consular certificate that the same have been exposed to a temperature of 212° Fahr. by boiling. Nine-tenths of the outbreaks of zymotic diseases in the United States may be tracked to the doors of the rag and old-clothes men, and the sooner the American people realize this fact the better for all concerned. No conscientious and honest rag-importer, with the good of his fellow-countrymen at heart, can possibly object to the sanitary inspection of his stock. The objectors to the present Treasury Department rules should be marked—they seek to fill their pockets at the expense of the health and lives of their neighbors.

"The last year's rags from cholera-infected Marseilles and other Mediterranean ports will soon arrive, unless the Treasury Department prohibits their import. Are the rag and old-paper importers willing to assume the responsibility of introducing such material into our crowded American cities?

"You state, at the conclusion of your Washington despatch, that 'the paper men believe that Secretary Manning accepts their view of the matter, and will come to their relief.' They are reluctant to cause public agitation of the matter, however, as that invariably results in the presentation of the other side of the question in equally strong terms by sanitarians."

It is generally understood that Dr. John C. Peters has given much attention to the history of cholera. When a reporter asked him recently whether it was likely that cholera could be brought here in baled rags, he is reported to have said:

"I should be afraid of them. I should be afraid of those last Japanese rags that they are making such a fuss about, for, although there has been no recent outbreak of cholera in Japan, it prevailed there some years ago, and it is a matter of general knowledge that rags will retain the cholera germ for a long period of time. Of course they will not hold cholera as long as they will small-pox, but we don't want small-pox or any other infectious disease any more than we do cholera.

"Then, too, it must be borne in mind that even though rags may come from a port where cholera has not prevailed, that is not a guarantee that they do not contain the deadly germs, for people move about from place to place, and from country to country, carrying with them old clothing which afterward go into rag bales. It is therefore quite possible for a family from a cholera district to go into a previously unaffected place, and, if they do not develop the contagion there, to send it thence in the rag bale. It has been of frequent occurrence that cholera has been carried to far-away countries in old clothing. For instance: In 1867 the disease broke out in the heart of South America, and this was pointed to as an evidence that it could be generated on American soil. Those who were informed on the subject knew that this could not be so, for it never existed here except through importation. Inquiry was set on foot, but it was not until several years afterward that it was shown that the disease had been brought from Genoa, Italy, to Brazil, in the clothing of some Italian immigrants. Last year two ships arrived from Genoa at Brazil, with people from a cholera district, but the Brazilian authorities had been taught a lesson from which they profited. The ships were not allowed to land, but had to go back to Italy, and South America escaped the cholera at that time.

"The history of the breaking out of cholera in Spain last year is interesting, and positively sustains the theory, or fact rather—for so it has come to be accepted—that the disease is carried in old clothing. It all came from one family that, try-

ing to escape the rigid quarantine, shipped from Marseilles down to Algiers, and from there shipped to Alicante, in Spain. Their clothing, of course, had not been disinfected, and shortly after their arrival the disease broke out in Alicante. It lingered there during the winter, and has since been doing deadly work."

In compliance with the request of the Surgeon-General of the United States Army, Dr. Sternberg gave the following opinion:

BALTIMORE, MD., March, 1885.

To the Surgeon-General U. S. Army, Washington, D. C.—

GENERAL: In compliance with instructions contained in a communication dated March 19, 1885, and with the request contained in the enclosed communication from the Honorable Secretary of the Treasury, I have the honor to submit the following opinion:

My studies relating to disease-germs leave no doubt in my mind as to the possibility of the importation of the germs of cholera, malignant pustule, small-pox, and yellow fever in old rags, whether baled or otherwise.

The germs of malignant pustule (anthrax) may be preserved indefinitely without losing their virulence, and we have ample evidence that the germs of cholera, of small-pox, and yellow fever may be preserved in infected clothing or bedding for a considerable time—exactly how long a time has not been determined.

That such infected articles could be preserved in bales of rags can scarcely be questioned, and it seems apparent that they are likely to find their way into the rag-picker's collections during the epidemic prevalence of these diseases, especially in countries where there is no organized sanitary supervision. Very respectfully,

Your obedient servant,

GEORGE M. STERNBERG,

Major and Surgeon, U.S.A.

To the Editor of the "Evening Post"—

SIR: In the *Evening Post* of September 1st, you state: "There is no authentic case on record of cholera having been conveyed in rags, but great pains have been taken to alarm

the public through the telegraph and press." There is a case in the record of my memory as follows: In the summer of 1849, a whole family, somewhere in Northern Indiana, died with cholera. The clothing of that family was packed, late in the spring of 1850, and sent to some relatives in Castalia, O., who opened the box and used the clothing. This latter family was attacked with the disease, the first case there, and through them the cholera spread through that village and the surrounding country, and was very fatal.

I could site several instances during the prevalence of cholera, in the visitations of 1832 and succeeding years, and in 1849 and following years, where cholera was carried by persons having contracted the disease where it was epidemic to places otherwise free, and places perfectly healthy in every other respect and all other seasons. It was carried from Maysville, Ky., on the Ohio River, to West Union, O., seventeen miles distant, about 1834 or 1835, a town entirely free of all malaria, etc. It was carried from Columbus to Mt. Vernon, O., in 1850, by a gentleman who had a severe attack in Columbus in 1849, and recovered that year. He died with the disease in 1850, in Mt. Vernon, one of the healthiest places in Ohio. Either in 1849 or 1850, a large number of Irish laborers were engaged in the building of the Central Ohio Railroad, on the east side of Walnut Creek, seven miles east of Columbus, at a large embankment. They were all perfectly healthy until late in the season, when a woman arrived there infected with the disease and died, and it spread among the laborers and many died. The first case, in 1849, in Columbus, was that of a citizen who visited Cincinnati, where it was epidemic, contracted the disease there, and was attacked on his return home and died, and a few others took it from him, when, from their excreta, etc., the atmosphere became infected and the disease became epidemic.

It seems to me that the greed of importers and dealers in rags has more influence on their opinions than a humane regard for the public welfare. I had hoped that the prohibition by the Treasury Department of the importation of rags would have been continued until either the disease had spent its force in Europe or appeared here as an epidemic. From close observations of the visitations of 1832, etc., and 1849, etc., I be-

came satisfied that cholera was contagious from the excreta and clothing of the sufferers.

Cholera is a cold disease, very much aggravated by fear. Courage, quiet, keeping warm, etc., no cold drinks, all drinking water boiled, no exposure to night air, I observed were material aids in the prevention of attacks of this disease. Most of the attacks begin in the night. It comes in two forms—one very violent, ending in death in from two to five hours, incurable; the other insidious, beginning with a mild, painless diarrhœa, which should be attended to at once and a physician called, and is curable generally if properly attended to in time. I have no expectation that cholera can be kept out of the United States, but still it may be delayed perhaps in coming until its virulence has somewhat abated.

S. BRUSH.

CANANDAIGUA, N. Y., September 3, 1885.

Dr. Sayre, formerly Resident Physician of the city of New York, when asked what articles he was particularly suspicious of, is reported to have said: "Well, more than anything else, the packed-up clothing of immigrants and the rags that were brought from infected districts. That last, by the way, is a matter that should concern us very much about these days, if there are to be any importations from the neighborhood of Marseilles, Madrid, and other infected localities or ports where transshipments from such ports could be made. Not only would there be danger now, but for many months to come."

Revue d'Hygiene, Paris, May 20, 1885; by Dr. G. Pouchet:

Page 392.—"When we think of the varieties of merchandise coming from abroad, and their more or less prolonged stay in the warehouses, or the masses, often considerable, accumulated in damp places, which favor the development of inferior organisms, we have reason to be surprised that their immediate use does not more frequently occasion contagious diseases or local troubles, such as phlegmons, an example of which I saw in a workman, who, having an excoriation of his hand, wrapped the injured part in a piece of rag, apparently clean. Our colleague, Dr. Napias, related, in his excellent *Manuel d'Hygiène Industrielle*, epidemics of small-pox breaking out among the workers manipulating old rags."

A decree of March 15, 1879, issued on the advice of the Comité Consulatif d'Hygiène Publique de France, rendered obligatory the disinfection of rags, old clothes, paper-rags, etc., coming from foreign countries, particularly from the East, from Egypt and Algeria, and limited this importation into France by the maritime channels to the ports of Marseilles, Panillac, St. Nazaire, and Cherbourg, alone provided with apparatus and sufficient means of disinfection.

MM. Lecourteux and Garnier, in their machine-shops in the St. Oberkampf: In July last, at the time of the rumors of the invasion of cholera, these manufacturers, ignoring entirely the source of the rags which they used, decided to submit them to the action of steam before utilizing them. After some experiments they adopted the following process. Since that time each new delivery of rags is thus treated before being distributed to the workers, etc. The process is then described by Dr. Pouchet, and consists in putting them in a copper boiler with a double bottom, pierced with holes, and steam introduced under a pressure of three atmospheres.

The following discussion on the paper of Dr. Pouchet ensued: "M. Lunier called attention to the fact that formerly the skin diseases were frequently in the Maisons Centrales, where the prisoners are occupied in sorting woollen rags. It is no longer so, since the contractors have been obliged to previously disinfect the rags with sulphurous acid.

"M. Vallin thinks, with M. Pouchet, that it will be easy to disinfect the rags with steam before submitting them to the operations of sorting and tearing, which are very dangerous. One can scarcely understand why like measures were not adopted with the paper-manufactories where neither heat nor steam pressure are wanting. But what is of more importance, and more difficult, is the disinfection of rags on their entrance on the frontier or in our ports. The danger is at Marseilles, because the rags come from eastern countries, where the filth is excessive and pestilential diseases of all sorts prevail. For many years they have sought means for rapid disinfection of the large compressed bales before allowing them to be taken away by the railroads; now these bales are looked into, if not opened, on the dock, and the rag-dealers deduct samples, which are handled and scattered through the city. M. Pasteur

thought that these bales could be traversed by a current of sulphurous acid gas without opening them, by means of an ingenious arrangement which M. Raulin was so kind last year as to send us the description and the design of.

"M. Olliver: It is not alone in the workhouses, but also in the storehouses, of rags that disinfection is necessary; diphtheria, variola, scarlatina, etc., have been observed around this hot-bed.

"M. Gariel believes that it is difficult to cause a gas to pass through rags compressed by hydraulic pressure.

"M. Pouchet: It is impossible to disinfect in the storehouses; among them are some too low; the only and true solution which this question allows is the suppression of storehouses in Paris."

British Medical Journal, vol. ii., 1884, p. 629, September 27, 1884. Imperial Board of Health, July 29, 1884:

"Concerning the case quoted by Professor Leyden, Professor Hirsch said, that in the town of Mühlhausen, in Thuringia, there were nine cases of cholera, four of them proving fatal, in the cholera epidemic of 1873; all of which, with the exception of one case, belonged to one house. The house was inhabited by six families, numbering twenty-three persons; three of the families, numbering eleven, inhabiting the basement floor. Behind the house was a drain of a closet which was used only by the inhabitants of the basement, other water-closets existing for the inhabitants of the lower stories. The first case, which took place on August 26th, was that of a woman who had come a few weeks before to Mühlhausen from St. Louis, in the United States of America, via New York, Hamburg, and Bremen, but had only received the things brought with her from America about the beginning of August. Among these effects were some soiled linen, which she sent to be washed; and some confectionery, which she and her sister, in whose house she was living, partook of. A few days afterward the new-comer was attacked with cholera; then her sister; her child and her grandmother also had severe attacks of diarrhœa, and soon afterward cases of cholera occurred among the other families inhabiting the basement; so that, out of the eleven persons inhabiting the basement, only two escaped the disease, and four died of it; while of four among the inhabitants of the upper stories, who had afforded the sick persons assistance, and also took charge of the old woman and the child, who

had become ill, not one case of cholera occurred. That at the time when the effects left St. Louis cholera had been raging especially severely, in the quarter of the town, too, from which they came, has been accurately proved. The appearance of cholera in that house in Mühlhausen, where there had been no case till then, after the arrival of the luggage, induces the reporter of the case to believe that the specific poison of the disease was introduced with the baggage, and that the farther spread of the disease among those inhabitants of the basement, who had not come in contact with the things, was explained as infection from the closet used in common by the inhabitants of the basement, the dejecta of the first patient having been thrown into it."

Dr. Hirsch said: "An interval of from four to six weeks between one case of cholera and the outbreak of an epidemic caused by personal effects was completely reconcilable with Dr. Koch's views."

Dr. Koch possessed dried anthrax material which was still efficacious after twelve years. In small-pox, infection sometimes took place after a year, or longer, and the vaccine could be preserved in a dry state for years. Linen packed together could still remain damp after the lapse of some weeks, and thus contain vital comma-baccilli.

Annales d'Hygiène Publique, March, 1885. By Professor Brouardel. Preservation of Europe from Exotic Diseases. Extract, page 239:

"This cholera patient, scarcely affected, leaves his home, goes where his occupation calls him, disseminates everywhere his dejections, sometimes over great distances, and these contaminated matters can poison the air we breathe or the water we drink."

Page 241. "The linen which has been polluted by the dejecta of cholera patients are powerful agents of propagations, sometimes direct when by the contact of the hands one carries the germ to the food, when one breathes the effluvia, or indirect when the people drink the water below the wash-houses.

"'In order that you may understand the importance of this question, let us cite two examples:'

Page 142. "The epidemic of Yport: The sailors arriving from Newfoundland, absolutely healthy, debarked at Hetta, where the cholera was raging. Some died. They decided to

return by the railroad to their native country, Fécamp and Yport. One of them died at Parascon; his trunk continued the route, remained eight days on order at Paris, went to Yport, an old woman opened it, emptied it, and washed the clothes; she died two days after, and created a focus far from all communication with any other centre. The soiled linen had been the only means of contact."

Are the germs of cholera of long vitality?

You will acknowledge the importance of this question. At every turn they ask us, Shall we have the cholera in the spring? We must answer that we know absolutely nothing about it. In those determined conditions these germs have indeed a very persistent duration of life. Thus Dr. Brown, of New York, reports a woman of sixty-seven years died of cholera during an epidemic. Ten months after there had been no more cholera in the country the husband opened a trunk which contained the clothes of the woman, to give them up to his niece. That man died the next day of cholera.

THE ACTION OF DISINFECTANTS ON MICROZOOIDS.*

By A. Wynter Blyth, M.R.C.S., F.C.S., etc.

The author enumerated the diseases of animals and men which may be considered beyond a doubt to have an intimate connection with microzooids, viz., mouse and rabbit septicæmia, a fatal disease of the guinea-pig, produced by the micrococcus tetragenus; the anthrax of animals and men, fowl-cholera, glanders, malignant œdema, bovine and human tuberculosis, erysipelas, some forms of pneumonia, and acute osteo-myelitis. On the other hand, it had not been proved satisfactorily that diphtheria, scarlatina, relapsing fever, cholera, typhoid fever, and some others were due to microzooids, though the balance of evidence seemed to be in favor of such a view; probably zymotic diseases would come to be recognized as consisting essentially of the invasion of the tissues of

* Abstract of a paper read before the Medical Officers of Health Society, March 20, 1885.

individual megazooids by legions of microzooids. The term "disinfectant" the author used throughout as synonymous with "germicide." A colony of microzooids submitted to a solution of a true disinfectant, and then having been freed from the disinfectant and put into the best possible conditions for development and growth, showed no signs of life; the colony had been disinfected—that is, killed. Hence, according to this view, disinfection is either a destruction of pathogenic microzooids or a poisoning of them; the end effected being for practical purposes the same. The author then briefly detailed his own experiments on spore anthrax, published in the "Royal Society of Edinburgh's Transactions," and summarized the experiments of Schiff and Fischer on phthisical sputum, and those of Fischer and Proskauer on the action of chlorine and bromine. The author had made some observations on mouse-septicæmia; threads were infected with mouse-septicæmia and soaked for half an hour in Tuson's disinfectant, a saturated solution of sulphate of iron, a ten per cent. alcoholic solution of cresylic acid, a ten per cent. solution of sulphenic acid, a ten per cent. solution of chlorozone, and a strong solution of chloride of zinc. The sulphenic acid and the alcoholic solution of cresylic acid disinfected perfectly the thread; but of the other agents some had no effect; others superficially disinfected. His most recent researches were on the pyridine bases. He had raised a pure cultivation (from the last stages of nasal catarrh) of a yellow bacillus which liquefied gelatine; the liquid gelatine then becoming yellow and fluorescent. This bacillus produced spores of moderate resistance, was not pathogenic, and grew with rapidity at ordinary temperatures. Threads infected with this yellow bacillus were soaked in a one per cent. solution of pyridine, collidin, lutidine, and acridine, and then, having been freed from the disinfectant, they were brought up on nutrient gelatine; the threads were found to show no signs of growth around them, whereas the "control" threads grew rapidly. The antiseptic power of pyridine was tested on the organisms found in sour milk, and pyridine was shown to inhibit growth. Since the pyridine bases are present in tobacco smoke, the smoke from an ordinary pipe of tobacco was passed through water, and the resulting solution was found to be, so far as the yellow bacillus is concerned, strongly dis-

infectant. The results of experiments with the yellow bacillus, when treated with solution of morphine, strychnine, atropine, and other alkaloids, were also given, from which it would seem that strong solutions will kill the bacillus. Turning to the practical aspect of the question, the author summarized the general conclusion to be drawn from these researches. Disinfectants, when they are not destructive agents, act as poisons; they poison the microzooid in a manner not essentially different from the lethal poisoning of a higher life form, and this is the reason why such poisonous substances as corrosive sublimate, carbolic acid, and chlorine are most to be relied upon. It was evident that, to perfectly disinfect, the element of lime must not be disregarded; to receive the specific excreta in a strong solution of sulphate of iron or of carbolic acid, and then within a few minutes cast the excreta into a drain, could only superficially disinfect, and such excreta might in many obvious ways again become dangerous. He considered that the best and most efficient way to disinfect a room after disease was: First, to make it as much as possible like an hermetically sealed box, and in this box to evolve chlorine; three pounds of chloride of lime and three pounds of hydrochloric acid for every thousand cubic feet of space. The chloride of lime was to be divided into several distinct parts in deep vessels, and to be placed as high in the room as possible; the hydrochloric acid was to be mixed with the chloride of lime gradually, in the manner described by Fischer and Proskauer. The room was to be kept closed for twenty-four hours. Secondly, all things in the room capable of being submitted to a moist heat were to be taken away to a suitable apparatus. Thirdly, the floor was to be washed with a solution of corrosive sublimate (1 in 1,000). The principles of this process had been carried out in the parish of Marylebone for more than a year, and the author considered the method the best at present known.

THE MILK FOOD prepared by the Anglo-Swiss Condensed Milk Company perfectly agrees with the analysis given on their labels, and bears witness to the excellent and rational manner in which this food is compounded.—*Dr. E. Geissler.*

HEALTH OF THE UNITED STATES ARMY.

FOR THE MONTH OF JULY, 1885.

DURING the month of July, in eight military departments, embracing 137 military posts and arsenals, and 34 commands operating in the field, from which reports were received, there was a total mean strength of 23,971 officers and enlisted men.

There were admitted to sick report 3,369 cases of disease and injury, or 141 per 1,000 of strength.* This is an increase of 32 per 1,000 above the rate for the previous month, 9 per 1,000 below that for July, 1884, and 4 per 1,000 below the average monthly rate for the ten years, which was 145 per 1,000 of strength.

Nineteen deaths occurred, as against 16 for the previous month, and 26 for the previous July. This represents an annual mortality from all causes of 10 per 1,000, or 2.8 per 1,000 less than the average for the preceding decade, which was 12.8 per 1,000 of strength.

The number of discharges for disability was 66,† representing an annual loss to the army from this cause of 33 per 1,000 of strength.

The number of troops constantly non-effective from sickness was 977, or 41 per 1,000 of strength, being an increase of 3 per 1,000 since last month. The rate for the previous July was 43 per 1,000, and for the previous decade 45 per 1,000 of strength.

The rate of recoveries to the whole number under treatment was 727 per 1,000; the number of deaths 4 per 1,000.

The average duration of treatment among patients who recovered was 8 days, and among those who died, 32 days.

The causes of deaths were as follows: enteric fever, 2; dysentery, 1; enteritis, 1; pneumonia, 1; cancer, 1; malignant pustule, 1; erysipelas, 1; apoplexy, 1; Bright's disease, 3; nephritic abscess, 1; gunshot wounds, 2; incised knife wound, 1; crushed by railroad train, 1; drowning, 2.

* The names and diseases of all officers and enlisted men who are excused from any part of their military duty by reason of disability are required to be entered upon the reports from which these data are drawn.

† Recruits at depots discharged for disability which existed prior to enlistment not included.

The causes of admission, and those which have chiefly served to impair the health of the army during the month of July, are shown in Table I.

TABLE I.

Causes of admission in the order of their numerical importance.	Number of cases.	Rate per 1,000 for July, 1885.	Average rate per 1,000 for the previous Julys.	Increase or decrease of rate.
First.				
Injuries and accidents	591	24.66	22.00	+2.66
Contusions and sprains	306	12.77	14.80	−2.03
Incised, punctured, lacerated, and contused wounds	132	5.51	4.08	+1.43
Fractures (not shot)	14	.58	.60	−.02
Shot wounds	12	.50	.96	−.46
All other injuries	127	5.30	1.56	+3.74
Second.				
Diarrhœal diseases	826	34.46	34.95	−.49
Diarrhœa	748	31.20	29.84	+1.36
Dysentery	50	2.09	3.13	−1.04
Cholera morbus	28	1.17	1.98	−.81
Third.				
Diseases of the digestive system	376	15.68	?	?
Constipation, dyspepsia, and colic	218	9.09	12.32	−3.23
Tonsilitis, pharyngitis, and sore throat	59	2.46	?	?
Other diseases of this class	99	4.13	?	?
Fourth.				
Malarial fevers and resulting conditions	329	13.72	22.79	−9.07
Fifth.				
Diseases of the nervous system	192	8.01	12.00	−3.99
Headache and neuralgia	165	6.88	10.31	−3.43
Other diseases of this class	27	1.13	1.69	−.56
Sixth.				
Venereal diseases	174	7.26	8.47	−1.21
Gonorrhœa and results	89	3.71	4.03	− 32
Syphilis and results	45	1.88	4.32	−2.44
Other diseases of this class	40	1.67	.12	+1.55
Seventh.				
Diseases of the respiratory system	117	4.88	7.65	−2.77
Catarrh	60	2.50	4.64	−2.14
Bronchitis	27	1.13	1.99	−.86
Pulmonary phthisis	7	.29	.39	−.10
Pneumonia	3	.13	.19	−.06
Other diseases of this class	20	.83	.44	+.39
Eighth.				
Rheumatism	68	2.84	8.66	−5.82
Ninth.				
Enteric fever	7	.29	.27	+.02

Among the more important diseases under treatment during the month of July—those remaining sick from the previous month being included—there were 11 cases of enteric fever, 7 new cases being reported; 10 cases of pneumonia, 3 of which were new admissions; and 21 cases of consumption, of which 7 were admitted this month.

This is an increase of 5 cases of enteric fever, a decrease of 2 cases of pneumonia, and an increase of 3 cases of consumption from the whole number under treatment in June.

The mortality from enteric fever was 18 per cent., from pneumonia 10 per cent., and from consumption 0 per cent. of cases treated.

Of contagious and infectious diseases, there were 2 cases of erysipelas, 2 of mumps, and 1 of measles, all newly admitted since the previous month.

A comparison of the health of the several military departments may be seen in Table II.

TABLE II.

	Admission rate per 1,000 of mean strength.	No. of troops per 1,000 of mean strength constantly non-effective from sickness.	Average number of days treated among patients who recovered.	Rate per 1,000 of deaths to number of cases treated.
Department of:				
East	181	44	7	7
Texas	178	65	9	4
Missouri	158	40	7	4
Dakota	126	36	8	3
Arizona	111	44	7	4
Platte	105	36	9	6
California	88	34	9	0
Columbia	80	26	8	6
The entire army for the month	141	41	8	4
The entire army for the preceding decade—monthly average	145	45	?	7.2

Fifty-two posts have shown an admission-rate for the month which was above the normal of 145 per 1,000 of mean strength, and 82 below.

The posts showing the highest rates were: Fort Myer, Va., 579 per 1,000; Willet's Point, N. Y., 481; Fort Gibson, Ind. Terr., 453; Indianapolis Arsenal, Ind., 408; Fort Davis, Tex., 364; Jefferson Barracks, Mo., 350; Fort Sill, Ind. Terr.,

314; Springfield Armory, Mass., 250; Fort Warren, Mass., 241; Fort Fred. Steele, Wyo. Terr., 240; Mount Vernon Barracks, Ala., 237; Fort Riley, Kan., 235; Fort Sidney, Neb., 230.

The lowest admission-rates were at Fort Gaston, Cal., 0; Fort Trumbull, Conn., 0: Fort Canby, Wash. Terr., 13; Fort Elliott, Tex., 19; Alcatraz Island, Cal., 29; Watertown Arsenal, Mass., 32; Fort Union, N. M., 36; and Fort Hays, Kan., 40 per 1,000 of strength.

Forty-nine posts have shown a rate of constant non-effectiveness from sickness above the normal of 45 per 1,000 of mean strength, and 87 below.

Those showing the highest constant rates were: San Diego Barracks, Cal., 181 per 1,000; Fort Lowell, Ariz. Terr., 178; Fort Davis, Tex., 138; Fort Robinson, Neb., 129; Fort Gibson, Ind. Terr., 92; Little Rock Barracks, Ark., 90; Fort Stockton, Tex., 87; Mount Vernon Barracks, Ala., 85; while the lowest rates were: Kennebec Arsenal, Me., 0; Watertown Arsenal, Mass., 2; Fort Winfield Scott, Cal., 5; Fort Niagara, N. Y., 6; Frankford Arsenal, Pa., 7; Fort Trumbull, Conn., 8; Fort Ontario, N. Y., 8; Fort Mojave, A. T., 8; Fort Marcy, N. M., 9; Watervliet Arsenal, N. Y., 9; Fort Mackinac, Mich., 10; Fort Canby, Wash. Terr., 10.

At stations showing a high admission-rate, diarrhœal and malarial diseases, together with those of the nervous system, have prevailed. The causes producing high constant rates were: phthisis pulmonalis, chronic bronchitis, venereal and diarrhœal diseases, also gunshot wounds and other injuries.

During the month of July enteric fever existed at nine stations, viz., at Fortress Monroe, Va., three cases; West Point, N. Y., St. Francis' Barracks, St. Augustine, Fla., Fort Clark, Tex., Fort Riley, Kan., Fort Snelling, Minn., Fort Washakie, Wyo. Terr., Fort Omaha, Neb., Fort Walla Walla, Wash. Terr., one case each. Those at Fortress Monroe, Va., St. Augustine, Fla., West Point, N. Y., Fort Clark, Tex., and Fort Riley, Kan., were new admissions; that reported at Fort Riley, Kan., occurred in a recruit brought directly from Jefferson Barracks, Mo.

Pneumonia existed at nine stations, as against 8 for June, 9 for May, 15 for April, and 22 for March. At Fort Randall,

Dak. Terr., there were two cases, both remaining from the previous month, and at the other stations one case each.

Erysipelas was reported among the troops at Columbus Barracks, Ohio, and Fort Concho, Tex., one case each.

Mumps at Jefferson Barracks, Mo., and Cp. at Crisfield, Kan., one case each.

Measles at Cp. Poplar River, Mon. Terr., one case.

Reports received from 34 commands operating in the field, showed an aggregate mean strength of 2,452 officers and enlisted men. One hundred and ninety-three cases, or 79 per 1,000 of strength, were admitted to sick report during the month, of which number 8 were transferred to permanent stations for treatment, and appear upon their returns.*

Of the admissions, 151, or 78 per cent., were for disease, and 42, or 22 per cent., for injuries.

Twenty commands were operating, or en route, in the Department of the Missouri, their strength aggregating 1,453 officers and enlisted men, with 140 cases of disease and injury, or 96 per 1,000. Eight commands in the Department of Arizona, representing a total mean strength of 335, with 11 cases of disease and injury, or 33 per 1,000. In the Department of the Columbia three commands, with a total mean strength of 56, and only 2 admissions to sick report, or 36 per 1,000. In the Department of the Platte one command of 524 officers and enlisted men, with 34 admissions to sick report, or 65 per 1,000. The Department of California had one command of 29 officers and men, which furnished 5 admissions to sick report during the month, or 172 per 1,000. In the Department of Texas, one command of 55 officers and enlisted men, with 1 sick, or 18 per 1,000.

The prevalent diseases were malarial fevers and diarrhœal diseases, together with those of the digestive system.

Attached to the army, and living at the different military stations, were 4,872 women, and 5,981 children, the wives, children, and servants of the officers and enlisted men.

Among the women there were reported 367 cases of sickness during the month, or 75 per 1,000 living. Two deaths

* To avoid duplication these cases are dropped in the final consolidation for the entire army.

occurred, representing an annual death-rate of 4.9 per 1,000 living.

The causes of death were: chronic phthisis, 1, and apoplexy, 1.

Among the children 376, or 63 per 1,000 living, were taken sick. Twelve deaths occurred (11 of which were under five years of age), representing an annual death-rate at all ages of 24.1 per 1,000 living.

The causes of death were: cholera infantum, 3; enterocolitis, 3; capillary bronchitis and diarrhœa, 1; diarrhœa, 1; intermittent fever and convulsions, 1; gastro-enteritis, 1; intestinal intussusception, 1; and marasmus, 1.

Measles appeared among the children at Plattsburg Barracks, N. Y., 9 cases; at Fort A. Lincoln, 12 cases—two remaining from previous month; also Augusta Arsenal, Ga., 1 case. This disease is still reported at Fort Winfield Scott, and Benicia Barracks, Cal. Whooping-cough is at Vancouver Barracks, Cal.; Fort Snelling, Minn. (Headquarters Department of Dakota); and 2 cases remain from previous month at Fort Wayne, Mich.

Diarrhœal diseases have prevailed extensively among this class; malarial disorders and catarrhal affections being next in order.

BENJAMIN F. POPE,
Major and Surgeon U. S. Army.

RECORD AND PENSION DIVISION
SURGEON-GENERAL'S OFFICE,
WASHINGTON, D.C., October 28, 1885.

RAILWAY ACCIDENT STATISTICS show that in the four European countries where railway traffic is most developed, viz., the United Kingdom, Belgium, France, and Prussia, the proportion of railway accidents as compared with the number of passengers annually carried is as follows: United Kingdom, one passenger killed in every 5,250,000, one passenger injured in every 750,000; Belgium, one passenger killed in 9,000,000, one injured in 1,650,000; France, one passenger killed in 2,000,000, one injured in 500,000; Prussia, one passenger killed in 25,500,000, one injured in 4,000,000.—*Insurance Monitor.*

SANITARY INSPECTION OF A HOUSE.

IF an engine gets out of order, the attention of the engineer is immediately attracted by some strange noise. A careful engineer will immediately make an examination of his machinery and correct the trouble. If a man's house, the domicile of all he cherishes, becomes in an unsanitary condition, the first warning is conveyed by an unusual odor—not necessarily unpleasant or noxious. To correct this, not being an expert, he should secure the services of a sanitary inspector, either officially attached to the health department or in business for himself as a sanitary engineer. As it is not always possible for a householder to know that his sanitary inspector is competent to pass intelligently an opinion upon the condition of his house, it is advisable that he have some means of knowing what course should be pursued. If the inspector knows what he is to look for, and how to look for it, he will proceed somewhat in the following manner:

As an odor is oftenest the indicator of the trouble, he will trace it to its source. The drainage of the house will usually be first examined. If the odor is strongest in the basement, he will search for a broken house-drain, or one unjointed by faulty workmanship or by ground settlement. A damp cellar-floor will often notify him of the location of the leak. He should ask about rats, and, if often seen, he will conclude that they find entrance from the sewer through channels left by careless workmen or made by themselves. The soil pipe and house-drain are then examined for openings or putty-joints, and the larger lead pipes for holes gnawed through. He will also examine the traps, and see if they are syphoned, or faulty, or unventilated. An examination of the house-drain showing an upward current signifies an absence of a running-trap on the drain, or that, if present, it is syphoned. If the house has no connection with the sewer, but delivers its sewage into a cess-pool, a foul odor from the drain may indicate that the cesspool

is unventilated and unclean. Oftener country houses only deliver waste-water into a cesspool, allowing the excreta to be deposited in that climax of nuisances, the privy vault. In such cases the kitchen-sink will usually give off a fetid odor, traceable direct to a foul drain and cesspool. In looking into a cesspool which has been closed for some time, the inspector may incautiously carry a light too near and cause an explosion, which, if it is not more serious, will burn off his whiskers and eyebrows.

If he finds no opening in the house-drain, and its traps are all secure, other parts of the cellar are examined, and sometimes a floor-trap intended to drain the floor from overflows or washings will be found empty. If the inspector detects an ammoniacal odor, he will make inquiry as to whether the stable-drain empties into the house-drain or into the same cesspool. If there is complaint that the odor is most noticeable in the sleeping-room, the inspector will examine the water-closet, which may be the objectionable pan-closet, or be imperfect, broken, or not perfectly connected. There may be a bad connection between the closet outlet and soil-pipe. The soil-pipe may be broken, contain sand-holes or other imperfections, or, if of lead, have been punctured by a careless carpenter's nail. The connection of the soil-pipe with the house-drain will be noted. If a leak in the soil-pipe is suspected, he may employ the peppermint test. The odor may arise from a foul condition of the lead safe usually put under closets which are closely framed up. An occasional odor may come from the closet when the handle is pulled, which would indicate that the soil-pipe did not extend above the roof. The stationary wash-stands will always be examined, and, if trapped, the traps examined as to syphonage. The bath waste-pipe and its trap may be the source of trouble. If he finds the odor in the pantry or storeroom, he will inquire as to the connection of the refrigerator waste-pipe with the house-drain. Odors in the attic may proceed from the ventilating-pipe, from the house-drain opening too near the windows, or from water-tanks, which often become foul. It is not to be expected that the inspector can do impossible things. There may be an odor caused by something entirely extraneous to the sanitary arrangements of the house, such, for example, as a dead animal

in the walls. It is wise to have the inspector test, with a mercury gauge, the tightness of the gas fixtures. There may arise an odor from decaying wood, caused by soakage of sills on foundation walls, a broken rain-water leader, or roof-gutter. The inspector may give an expression concerning the ventilation of the house, and ten chances to one it will be bad.—*Building and Engineering Times.*

INFLUENCE OF MARRIAGE ON CHOLERA.

A RECENT number of the *Journal des Assurances* contains a short article on the mortality from cholera to which married and single men in Paris were respectively subjected during the last visitation of that disease in the autumn of 1884; and as the matter is worthy of some attention, we append a free translation of it:

"The statistical returns of the city of Paris give an analysis of the deaths occasioned by the last cholera. We extract the following points for consideration which it may be interesting to notice. It is known that old men are especially liable to cholera, also persons who have been brought to a low state of health by grief, fatigue, privation, or excess; but, besides these, the civil condition of men exercises a considerable influence on their susceptibility to the malady. The following figures will enable our readers to judge of this:

DEATHS OF MALES OUT OF 100,000 POPULATION IN PARIS FROM NOVEMBER 3 TO 20, 1884.

Age period.	Single.	Married.
25–30	51	18
30–35	78	21
35–40	58	40
40–45	152	44
45–50	83	47
50–55	167	37
55–60	83	57
60–65	117	
65–70	89	46
70–75	455	

"This table shows clearly that at all periods of life single men presented about two or three times more deaths than married men. The social position of many bachelors, and escially their habits of living (for a great number of them would be obliged to live in unhealthy proximity to one another) may perhaps explain this surprising difference, which, indeed, deserves a deeper study than which it is possible to make from the facts supplied by the *Bulletin de Statistique.* Another fact which is no less remarkable is that cholera has attacked men and women most unequally. From the 3d to the 20th November, there were 561 deaths of males (or 50 out of 100,000) and only 379 deaths of females (or 33 out of 100,000)."

The foregoing statistics are not uninstructive, although they are put forth in a loose, inexact way that goes far to rob them of any value they might have. The proportions of male and female deaths, referred to in the closing sentence of the extract, evidently relate in each case to 100,000 persons (males and females combined), although this is not so stated, and in the absence of remark it might well be thought that the male deaths were compared with 100,000 male inhabitants of the city, and the female deaths with an equal number of the female units of the population. On the main question of the respective susceptibility to cholera of married and single men it is impossible to form any opinion until the relative numbers of married and single men in the total population are known. The death-rate prevailing among any special class of lives can only be determined by taking the ratio of the observed deaths in that class to the total number of such persons who were exposed to the risk of death. Hence, if we accept the figures given by the official *Bulletin* as correct and unimpeachable, we are yet quite unable to compare the mortality from cholera among married with that among single men until we are informed how many married and single men respectively were in Paris at the time of the outbreak. The *Journal des Assurances* devotes much of its space to statistical questions, and its knowledge of insurance matters seems wide and sound. We are surprised, therefore, that it should have shown itself ignorant of so fundamental a principle as that to which we have made reference.—*London Insurance Record.*

THE CONTENTS OF CHILDREN'S MINDS.*

By CHARLES ROBERTS, F.R.S.C.

THE curious answers to examination questions recorded in the *Journal of Education* and many other papers, during the past month, have, for many persons, a grave as well as a ludicrous aspect, and it is not at all certain whether the laugh should not be against the teachers and examiners rather than the children. Medical men know how difficult it is to arrive at children's thoughts relative to things and conditions which immediately concern them, and how largely they are influenced by their imaginations and the casual and ill-understood remarks of persons about them. In examining sick children, we are accustomed to rely on the physical signs of disease and the report of adult attendants, and to regard the child's own statement with the utmost suspicion. In endeavoring to diagnose a child's knowledge, the examiner has, unfortunately, no physical signs of a definite kind to trust to, and he has, therefore, to frame his questions to find out what the child is supposed to have learnt from his teacher, or how much he has remembered. Now, considering how varied is the knowledge of the teacher, how different is his capacity for imparting instruction, how varied is the capacity of children for retaining and acquiring knowledge, and how different are the ways of examiners, it would be much better for the teacher, child, and examiner if the order were reversed, and a set of stereotyped questions, fitted to the intelligence of the various classes of children, were laid down, and the children taught to answer them. This method would, of course, be called cramming, and objected to accordingly. But all education which has an examination for its end and aim—which seems to be the object of all education now a days—is cramming, but cramming of an incoherent kind, as neither teacher, pupil, nor examiner knows what to expect of each other, and hence the

* From London *Journal of Education.*

ludicrous results we have been reading about in the journals. If the examination questions were known beforehand—and it would be easy to make them wide and comprehensive enough to demand a good deal of labor on the part of the teacher and pupil to master—education would become almost an exact science, and all the worry, anxiety, and disappointment which attend the present system would be done away with. In this way, and in no other that I can see, can proper codes of education, fitted to the varying intelligence, of children be constructed—such codes as I referred to in my article on the variation and correlation of the mental and physical faculties of children in the last issue of this journal.

Before we can formulate codes of this kind, however, we must endeavor to get some idea of the contents of children's minds before they have been influenced by educational discipline—the rough material they are to mould—and for this purpose we may gather many useful hints from some inquiries made by the Pedagogical Society of Berlin, and recorded in the *Statistisches Jahrbuch* for 1870, and by Mr. Stanley Hall, of Boston, U. S. A., and published in the *Princeton Review* for 1883. I would especially call the attention of the Education Society to these inquiries, as suggesting a field for "collective investigation." The object of the inquiry was to find out what amount of knowledge, and its pedagogic value, children of the poorest classes living in large towns bring with them at the commencement of their school course of instruction. It was, in short, an "entrance examination to determine the individuality of the children as far as conditioned by the concepts arising from their immediate environments," of children of from four to eight years of age. The examinations, in both Germany and America, were quite voluntary on the part of both examiners and children, and they were uninfluenced by the prospect of either rewards or punishments, and were unaccompanied by any of the terrors which, we have been told, attend visits of the government inspector. The whole work was a labor of love, and was carried out in a loving manner, and with no higher stimulus to its completion than the satisfaction of an intelligent curiosity.

With that greediness of knowledge which is so characteristic of the Germans, the Pedagogical Society drew up a list of

138 questions relating to local objects, such as public buildings, squares, streets, etc., to the individual and home life, to the farm, and objects of natural history; while the children were also questioned on their notions relative to natural phenomena, religion, and their acquaintance with Bible stories and Grimm's tales. Eighty-four schoolmasters (not inspectors) were invited to undertake the inquiry in the primary classes of their respective schools. "At first many of the children were questioned in classes, till, on account of intimidation in the presence of others, and other errors arising from a desire to appear wiser, or not more ignorant than their mates, it was found that more truthful results were obtained by questioning them in sections of eight or ten, although *this method nearly doubled the average ignorance displayed*, and quadrupled the work," and, out of a little over two thousand children to whom the questions were put, trustworthy results were thought to be obtained from only one-half the number.

With the advantages of the suggestions and warnings of the Berlin inquiry to guide him, Mr. Stanley Hall undertook to prepare a set of questions, suitable to the surroundings of American children, for a similar inquiry to be made in the primary schools of Boston, on children of "average intelligence," on their first entry. The problem he wished to solve was, "What may city children be assumed to know when they enter school?" and the difficulty and sources of possible error, which he saw stood in the way of its solution, shows how well he has studied child nature. "Not only," says he, "are children prone to imitate others in their answers, without stopping to think and give an independent answer of their own, but they often love to seem wise, and, to make themselves interesting, state what seems to interest us without reference to truth, divining the lines of our interest with a subtlety we do not suspect. If absurdities are doubted, they are sometimes only the more protested. The faculties of some are benumbed, and perhaps their tongues tied by bashfulness, while others are careless, listless, inattentive, and answer at random. . . . If children are pressed to answer questions somewhat beyond their ken, they often reply confusedly, and at random; while, if others beside them are questioned, they can answer well; some are bolder, and invent things on the

spot, if they seem to interest the questioner; while others catch quick and subtle suggestions from the form of the question, accent, gesture, feature, etc., so that what seems originality is really mind-reading, giving back our every thought, and sometimes only a direct reproduction, with but little distortion, because little apprehension, of what parents or teachers have lately told them." Mr. Hall is indeed so suspicious of his little friends that he scouts the idea of examining them in a class by a show of hands, or even in sections of eight or ten like the Berlin schoolmasters, and he has them questioned, three at a time, by experienced kindergarten teachers. Moreover, he is not content with the most honest and unembarrassed child's first answer to a direct question, without submitting him to a certain amount of cross-questioning to satisfy himself that the question has been understood, and that the answer represents real knowledge of the thing referred to. "If a child," says he, "has seen a cow, but, when asked its size, points to his own finger-nail or hand, and says 'So big,' as not unfrequently occurs, the inference is that he has, at most, only seen a picture of a cow, and thinks its size reproduced therein, and accordingly he is set down as deficient on that question." On the other hand, the examination is not too strict; "very few children know that a tree has bark, leaves, trunk, and roots; but very few indeed had not noticed a tree enough for our 'pass.'"

It will surprise no one, after all this commendable care and the large amount of time and labor spent on the inquiry, that a comparatively small number of returns were available for statistical purposes; but, such as they were, they are deserving of the greatest confidence. Mr. Hall's tables show the percentage of ignorance of the various subjects of inquiry, and the relative ignorance of boys, girls, and children trained in kindergartens, and also of the children of Irish and American parentage. A few extracts from the tables will serve to show the kind of questions submitted to the children, and the nature and extent of the ignorance which was found to exist; and, in making these, I have selected subjects on which children might be expected to be well informed rather than those which show the highest percentages of ignorance. Of common living things, 77 per cent. of the children had never seen a crow; 65.5, an

ant; 57.5, a sparrow; 50, a frog; and 20.5, a butterfly; 91.5 per cent. did not know an elm-tree; 83, a maple; 66, blackberries growing; 63 had not planted a seed; 61 did not know growing potatoes; 55.5, growing buttercups; and 21, growing apples. Of the parts of their bodies, 90.5 per cent. did not know where their ribs were; 70.5, their wrists; 36, their knuckles; 21.5 did not know their right hand from their left; and 15 did not know where their foreheads were. 75.5 per cent. did not know what season of the year it was; 65 had not seen a rainbow, and 14, the stars. 93.4 per cent. did not know that leather things come from animals; 89, what flour is made of; 50.5, the origin of butter; 36 had never saved cents at home, and 35 had never been in the country.

Both the American and Berlin returns show that, on the whole range of questions, boys are less ignorant than girls, but that girls excel in knowledge of parts of the body, home and family life, and the more common, near, and easy notions connected with child-life; and, as might be expected from the character of the questions, the children of the kintergartens far outstripped the others. The statistics were tabulated in order to ascertain the influence of age, but, although the ages ranged from four to eight years—the average being about five and a half years—the result was "surprisingly unpronounced," the advantage being slightly in favor of the elder children. Country-bred children were far in advance of town children, and it is interesting to know that American children do not hold the same views of Paradise as their parents, as we are told that, when good people die, they go to the country, and not to Paris, "even here from Boston," adds Mr. Hall.

Mr. Hall's paper shows that inquiring into the contents of children's minds must be an exceedingly interesting as well as a useful occupation both for schoolmasters and anthropologists, and not undeserving of the attention of that inconsiderable class of persons who devote their attention to probing the minds of cats, dogs, and monkeys. How curious, for instance, are the notions which the poor Boston children entertain of the sun and moon! At night, the sun goes, or rolls, or flies, is blown or walks, or God pulls it up higher out of sight. He takes it into heaven, and perhaps puts it to bed, and even takes off its clothes and puts them on in the morning; or it lies under the

trees where the angels mind it, or goes through and shines on the upper side of the sky. The moon comes around when it is a bright night, and when people want to walk, or forget to light some lamps. Thunder, which is often a source of terror to adult persons, presses lightly on the feelings of children: it is God groaning, or kicking, or rolling barrels about, or turning a big handle, or grinding snow, walking loud, throwing logs, having coals run in, hitting the clouds, etc. How quaint, too, are the notions that, when a cow lows, it blows its own horn; that butterflies make butter or eat it; that kittens grow on the pussy-willow; that honey comes from honey-suckles; and that poplin dresses are made of poplar-trees.

It is obvious that a child's thoughts are far from our thoughts on many of the simpler objects around us, and that the examiner's duties are far from being so simple as is usually believed. The high rate of ignorance indicated by the above percentages will, no doubt, surprise many readers of the *Journal of Education*, because the children they have known are much above the average in intelligence of the mass of poor town-bred children; it is well, however, that this fact should be brought to the knowledge of examiners and inspectors, especially of the elementary schools.

The result which Mr. Hall has arrived at is a very disappointing one, for he says that the knowledge which poor children bring with them to school "is next to nothing of pedagogic value," and he thinks that the best preparation parents can give their children for good school training is to make them acquainted with natural objects, especially with the sights and sounds of the country, and send them to good kindergartens. There is every reason to believe that the ignorance of the poor town-bred children in England is as dense as it is in Boston and Berlin, and that children of all classes are probably much more ignorant than is generally supposed; and their examination blunders would seem to indicate that the prevailing system of education is either too ambitious, or not well adapted to their mental development and social environments.

CARE OF THE TEETH.

DYSPEPSIA and bad teeth are common companions. Their relations as cause and effect may be controvertible, but that both are frequently due to the neglect of the teeth and their proper use, will not be disputed by any one who is familiar with the physiological relations of these useful and much-abused organs. The mouth, everybody knows, is the gateway to the stomach, the commissariat of health, and for its protection all that is conveyed thither requires careful selection and due preparation to fit it for healthy distribution. Hence *how* we eat is of scarcely less importance than *what* we eat. Chewing vigorously exercises and hardens the teeth, while it also stimulates the salivary glands to furnish the most essential means of rendering food acceptable to the stomach and easy of digestion, and without good digestion neither the teeth nor any of the other organs can be well nourished. That the teeth are commonly the first organs to suffer after, or contemporaneously with, indigestion, is due to the vitiated secretions of the mouth common to dyspeptics. By this the enamel is softened, becomes easily stained or looses its lustre, and for this the tooth-brush—often too hard and harsh for the teeth under the most favorable circumstances—is applied too vigorously or too frequently, and not infrequently with some mischievous insoluble powder or corrosive wash, with the common result of destroying the enamel and promoting decay.

Tooth-brushes should *always* be soft and rarely used more than once daily, before breakfast, which is quite often enough to remove the insoluble particles of food which collect at the margin of the teeth. Use the soft brush with water only, or, at most, with nothing else but pure soap in addition.

Soap is not only more cleansing than anything else, but it leaves a sweeter and pleasanter taste, and is never followed by injurious effects. A soft wood stick, to remove hard particles from between the teeth, and rinsing the mouth with water alone, after meals, is ordinarily quite sufficient to cleanse the

teeth without brushing them. Metal tooth-picks should never be used under any circumstances, and quills are, to say the least, not cleanly.

Chewing a pine stick, or better, when accessible, a dog-wood stick, is oftentimes a very salutary method of cleansing the teeth. It causes the saliva to flow freely, and this dissolves and washes away particles not easily removed by other means.

On the chemical theories of decay of the teeth we have no need to enter. No matter what its cause, a dentist should be consulted on the very first appearance of a point or spot of discoloration. Properly treated at the outset, it may be recovered for a lifetime.

All that is here said of the relations of bad teeth to dyspepsia applies equally to children—in the decay of deciduous teeth. There is no more certain sign of a dyspeptic, badly nourished child than the early decay of the deciduous teeth—or any more certain means of promoting dyspepsia and a puny constitution than its neglect.

The early decay of the deciduous teeth should be an admonition to parents to take special pains in the selection and preparation of the food, with a view to strengthening the digestive organs—including the teeth—and giving tone to the system; otherwise an enfeebled constitution will be the inevitable result.

A. N. BELL.

POLITICAL DRAINAGE.—We are not going into politics, and don't propose to "investigate" fraudulent or violent election processes in any part of the country, or strike the balance between the stalwart, mugwump, or democratic position on the vexed controversy of the negro vote down South. But we intend to keep on saying one thing—that universal suffrage, anywhere, is either a farce or a tragedy, if not both, in the presence of a great body of illiterate voters; and we have no faith in any political panacea for the abuse of suffrage that does not go down to hard-pan, and educate the citizen into a man too intelligent to be fooled, too honest to be bribed, and too resolute to be scared.

THE ORIGIN, WORK, AND PRESENT POSITION OF THE NATIONAL BOARD OF HEALTH.

By STEPHEN SMITH, M.D., New York.

THE origin, work, and present position of the National Board of Health are so little understood by the medical profession, and even by members of State and municipal sanitary organizations, that it may perhaps awaken a new interest in the subject by briefly reviewing the history of this central health authority.

The agitation for reform in the administration of affairs relating to the public health in this country was largely the reflex of a similar agitation in England. The first fruits of that movement was the organization of municipal and State boards of health having, as their most prominent feature, a thoroughly scientific medical element. The good work of these boards early arrested public attention, and the reform spread throughout the country, until the larger cities and many of the States had well organized and efficient boards of health. As this reform took on larger and larger proportions, it became evident that, at no distant day, a system of public health administration might be perfected in the United States which would cover the entire field of preventive medicine. That system would embrace the following departments of service: *

1. *Local Boards of Health*, to protect the individual and families from domestic causes of sickness and death.

2. *State Boards of Health*, to prevent the spread of domestic contagious diseases by co-ordinating the work of local boards, and co-operating with them, and the removal of the causes of disease which extend widely over the State.

3. *A National Board of Health*, fully empowered, 1st, to investigate the causes and methods of prevention of domestic pestilences widespread among the States and Territories, and aid local authorities in their suppression; 2d, to prevent the introduction of foreign pestilences into the country and their

* Some of the following statements are taken from a letter by the writer to the Chairman of the Public Health Committee of the House of Representatives.

spread from one State into another, by co-ordinating the operations of State boards, and co-operating with them; 3d, to examine and determine public health questions of international importance.

The first decisive step taken in national health legislation was the passage of an act by Congress—approved April 29, 1878—which conferred upon the Marine Hospital Service, of the Treasury Department, certain duties relating to the prevention of the introduction of contagious and infectious diseases into the country. This legislation was secured chiefly through the efforts of Dr. John M. Woodworth, Surgeon General of the Marine Hospital Service, an eminent sanitarian, who was fully impressed with the necessity of a central national health authority. In his effort to secure to his Service the public health functions of the General Government, he had the aid of prominent officers of the Treasury, and the support of sanitarians who sympathized with his views.

The great epidemic of yellow fever of 1878 brought the subject of a national health organization prominently forward, both before the public and before Congress. The American Public Health Association, which represented the sanitarians and the boards of health in the country, became the special medium of the public health interests in securing legislation. A great variety of bills were introduced into Congress, organizing a health bureau, and the whole subject was most thoroughly discussed in that body and throughout the country. This was especially true of the question, early raised and persistently urged, as to the propriety of conferring upon the Marine Hospital Service the necessary sanitary powers and duties. This scheme was rejected by the Public Health Association, by all sanitarians with one or two exceptions, and finally by Congress. The bill which passed created a board of health composed of seven members appointed by the President and Senate, and four members, *ex officio*, one from each of the following departments, viz., Medical Department of the Army; Medical Department of the Navy; the Marine Hospital Service; and the Department of Justice.* The act was approved March 3, 1879.

* The essential features of the law provided as follows:

1. That the Board shall consist of seven members to be appointed by the Presi-

The members * appointed by the President were all well known in the sections of the United States which they represented, for practical personal knowledge of the administration of health laws and familiarity with epidemic and pestilential diseases, and the members *ex officio* brought to the councils of the Board the varied knowledge and experience of the Army, Navy, Marine Hospital Service, and Department of Justice. The law was so drawn as to enable the Surgeon-General of the Army, the Surgeon-General of the Navy, and the Surgeon-General of the Marine Hospital Service to be detailed as members of the Board. The first important act of the Board was the appointment of a Commission to visit Cuba and investigate the sources of yellow fever. That commission, of which Dr. Stanford E. Chaillé, of New Orleans, was chairman, and Dr. George M. Sternberg, U.S.A., was secretary, made an exhaustive report upon all matters relating to the etiology and exportation of yellow fever from the island. Subjects relating to the public health were referred to the Board by Congress and the departments, and were duly considered. Experts were also appointed to make inquiries as to the origin of certain contagious diseases which prevailed in different

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dent and Senate, and of one medical officer of the Army, one medical officer of the Navy, one medical officer of the Marine Hospital Service, and one officer from the Department of Justice.

2. That it should make or cause to be made such special examinations and investigations at any place or places within the United States, or at foreign ports, as they may deem best to aid in the execution of the act and the promotion of its objects.

3. That its duties shall be to obtain information upon all matters affecting the public health, to advise the several departments of the Government, the executives of the several States, and the Commissioners of the District of Columbia, on all questions submitted by them, or whenever in the opinion of the Board such advice may tend to the preservation and improvement of the public health.

4. That the Board, with the assistance of the Academy of Sciences, shall report at the next session of Congress a full statement of its transactions, with a plan of a national public health organization.

* The composition of the Board was as follows: Appointed members: Dr. Samuel M. Bemiss, of Louisiana; Dr. Henry I. Bowditch, of Massachusetts; Dr. James L. Cabell, of Virginia; Dr. Hosmer A. Johnson, of Illinois; Dr. Robert M. Mitchell, of Tennessee; Dr. Stephen Smith, of New York; Dr. T. S. Verdi, of District of Columbia. The detailed members were as follows: Dr. John S. Billings, of the Army; Dr. P. H. Baillache, of the Marine Hospital Service; Hon. Samuel F. Phillips, Solicitor-General; Dr. Thomas J. Turner, of the Navy

sections of the country. Special investigations were subsequently ordered by the Board as follows: The collection of information with regard to the sanitary condition of some of the principal cities and towns of the United States; On the best methods of determining the amount and character of organic matter in the air, by Professor Remsen, of Johns Hopkins University; on the effects of disinfectants, by Drs. Bigelow and Bowditch, of Boston; on the composition and merits of the various patent disinfectants, by Professor Chandler, of New York; on the adulterations of food and drugs; on the diseases of food-producing animals; on the flow of sewers in relation to their sizes and gradients, by Col. Waring; a sanitary survey of Memphis, Tenn.; on the hygiene of the mercantile marine; on the influence of various soils upon sanitation, by Professor Pumpelly.

Meantime an extra session of Congress had convened. As the law of March 3, 1879, gave but limited powers and duties to the Board, and as there was a wide-spread apprehension, especially in the Southern States, that there would be a revival of the epidemic of yellow fever in the localities where it had prevailed in 1878, Congress passed another act enlarging the powers and duties of the Board. This act was approved June 2, 1879, and was limited in its operations to four years. The appropriation to carry this act into effect was $500,000. This Act conferred upon the National Board of Health all the duties given the Marine Hospital Service, by the Act of April 29, 1878, and contained also a repealing section. Sec. 9 provided as follows: "And so much of said Act as requires the Surgeon-General of the Marine Hospital Service to frame rules and regulations, and to execute said Act, and to give notice to Federal and State officers of the approach of infected vessels, and furnish said officers with weekly abstracts of consular sanitary reports, and all other acts and parts of acts inconsistent with the provisions of this Act be, and the same are hereby, repealed."

Scarcely had this Act become a law, when yellow fever made its appearance in several places, at Memphis, in its most virulent form. The Board was at once called upon to perform the new and untried functions of national co-operation with State and municipal authorities, in a warfare upon a common

foe. The duties growing out of these relations were of the most delicate character. The public funds were to be judiciously administered, the most effective measures were to be adopted and enforced, and local prejudices were to be overcome, so that the utmost harmony and concert of action might prevail. That the Board met the great emergency in the most enlightened spirit, and completely succeeded in its mission, there is abundant evidence. New rules and regulations were prepared by the Board better adapted to control the spread of the disease, and to stamp it out wherever it appeared. These rules provided for rigid medical inspection of all railroads and steamboats; sanitary cleansing of all ports and places attacked or threatened by this pestilence; removal of the people from badly infected districts to healthy localities; isolation of centres of contagion. These rules were adopted throughout the Valley States, and rigidly enforced. Local authorities were aided whenever it was duly certified that they could not meet the emergency. The result was most satisfactory. Though the disease broke out in many places where it had prevailed in 1878, and showed the greatest tendency to spread, yet it was gradually brought under control, adjoining localities were protected, while travel and traffic were but partially interrupted.

The experience of that season was of immense importance in the future efforts to protect the country from foreign pestilences. It was demonstrated, 1. That National, State, and local health authorities could usefully co-operate in suppressing an epidemic, and in preventing its spread from one State into another. 2. That travel and commerce need not be seriously interfered with, provided a vigilant sanitary inspection is maintained. 3. That when yellow fever has gained a foothold in a community the infected locality should, if possible, be vacated, and rigid sanitary cleansing and disinfection of it, and all the contiguous district, should be enforced.

On the subsidence of the epidemic the Board began to concert measures for the prevention of another outbreak, either from the germs of the former disease or from fresh importations from abroad. The first indication to meet in the prevention of a recrudescence of the germs of the former epidemic was believed to be the destruction of those germs dur-

ing the ensuing winter, and in towns, local sanitary improvements. To accomplish these objects, the Board secured the approval of local authorities to a scheme of universal cleansing, disinfection, and ventilation of dwellings, clothing and bedding throughout the Valley and Gulf States. Heretofore no special care had been taken during the winter months to destroy the germs of the fever which prevailed the previous season, and hence the recurrence of the epidemic. The result of this general cleansing was that the fever did not reappear at any previously infected locality. Local sanitary improvements were undertaken at the urgent request of the Board, the most notable of which was the entire reconstruction of the system of sewerage of Memphis.

The second indication to meet was decided to be the complete isolation of all infected ships from the mainland. It was believed that if vessels having on board cases of yellow fever were required to go into a properly equipped refuge station, on a suitable island, and were there subjected to a thorough overhauling, cleansing, and disinfection, the first and most important step would be taken toward the prevention of the importation of the germs of the pestilence. Accordingly, the Board proceeded to establish three insular refuge stations, viz., one at Ship Island, for the Gulf ports; a second at Sapelo Sound, for the South Atlantic coast, and a third at the mouth of the James River, for the Middle Atlantic ports. These exterior stations were to be under the exclusive control of the Board, but in no respect did they interfere with the local quarantines. On the contrary, being fully equipped for the proper care of infected vessels they were designed to aid the local quarantine in the performance of duties which the latter could not efficiently discharge. These exterior insular refuge stations for ships conveying the germs of foreign pestilences will prove one of the strongest defences which can be created.

The first year's work of the Board seemed to have given universal satisfaction. A great epidemic had been met by the combined forces of the National, State, and local health authorities, co-operating harmoniously to accomplish the one purpose of controlling its spread and stamping it out. Sanitary investigations had been undertaken, and some had been completed which were recognized as of great importance, and

which could only be properly conducted by the Board acting for the General Government. The funds of the Board had been so expended as to receive the special commendation of the Secretary of the Treasury, and of the President. Congress, at its next session, made suitable appropriations to carry on the work of the Board, and added an additional sum of $100,000 to be used only in case of an outbreak of an epidemic. This was known as the "Epidemic Fund," being a contingent appropriation. The experience of the Board during the first year of its operations proved that international co-operation was essential to any effective methods of preventing the spread of infectious and contagious diseases from one country to another. In order to secure such co-operation the Board proposed that Congress should take the necessary steps to that end. Accordingly a joint resolution of both Houses was passed and approved May 14, 1880, calling such a conference. Nearly thirty nationalities responded to the call, and the conference discussed all of the various phases of the questions proposed. Though there was considerable diversity of opinions, yet there was sufficient unanimity on the main points at issue to warrant the conclusion that another conference should be held, to which representatives should be sent empowered to formulate an international agreement. It is most unfortunate that the second conference has never been held, and the immense advantage to this country of international co-operation in preventing the importation of contagious diseases, obtained.

During the year 1880 yellow fever appeared only at one or two isolated points on the Gulf Coast, and the work of the Board was chiefly in the direction of organizing the refuge stations, strengthening and perfecting the local quarantines, and in prosecuting scientific investigations. The "Epidemic Fund" was not disturbed.

At the next session of Congress there began to be manifestations of hostility to the Board on the part of some of the members of the Sub-Committee on Appropriations. The funds for the continuation of the Board were made conditional, and were diminished so as to greatly curtail its work. The "Epidemic Fund" of $100,000 was, however, again appropriated, to be used in case of the emergency of an epidemic.

During the year 1881 the Board continued the operation of

the Refuge Stations at Ship Island, Sapelo Sound, and Portsmouth, and prosecuted some important investigations. Yellow fever did not appear, but frequent outbreaks of small-pox in Western towns, traced to emigrants, began to excite public alarm. At length the disease assumed so much importance as to lead to a conference of representatives of State Boards of Health and the National Board, at which a system of medical inspection of emigrants, and the vaccination of the unprotected, was inaugurated, and subsequently carried into effect on all of the great trunk railroads over which the emigrant trains were run. Along all of the interstate lines of travel the National Board sustained the inspection, and also at points where the Canadian roads terminated on the frontiers of the United States. The State Boards organized to prevent the spread of the disease in their respective States, while the local boards sought to secure general vaccination, and "stamped out" each individual outbreak. The result of this system of co-operation of National, State, and local boards to prevent a dangerous contagious and infectious disease, brought from foreign countries, was most successful. The epidemic outbreaks of small-pox soon ceased to occur, and the country was relieved of the pestilence.

Although this epidemic authorized the Board to use the "Epidemic Fund," yet it was found possible to avoid such use by the strictest economy in the employment of the funds appropriated for ordinary purposes. For two years, therefore, the "Epidemic Fund" remained undisturbed by the Board.

At the next session of Congress, 1881–82, a small sum was allowed the Board by that body. The "Epidemic Fund," though placed in the usual position of the appropriations for the National Board of Health, had this significant and remarkable qualification added, viz., "to be used at the discretion of the President." Prior to the adjournment of Congress yellow fever had appeared at Brownsville, Tex., and the authorities appealed for National aid. On the morning following the passage of the appropriation bill, the officers of the National Board called upon the President to inquire if the "Epidemic Fund" would not be immediately available to meet the growing epidemic of yellow fever in Texas. He informed them that he had already transferred his "discretion" in the use of the

"Fund" to the Secretary of the Treasury. He also added that, while he, personally, knew nothing about the matter, certain officers of the Treasury had assured him that Congress intended that the "Fund" should not be used by the Board of Health, but should be under the control of the agents of the Treasury. A Senator present, who had taken an active part in the discussion of the appropriation bills in the Senate, emphatically stated that Congress had no such intention, and reviewing the discussion on this subject in the Senate, proved conclusively that the Senate Committee on Appropriations regarded the "Epidemic Fund" as an appropriation to the Board of Health. The President stated, however, that as it was a matter with which he was quite unfamiliar, he had turned the "Fund" over to the Secretary of the Treasury, with power to exercise the "discretion" conferred upon him. He advised them to confer with the Secretary. As the Secretary was absent, a communication was addressed to him by the President of the Board, advising that the "Fund" be made immediately available, in order that the Board might proceed to organize, and aid in enforcing measures against the very threatening invasion of yellow fever in the Southwest. The Secretary replied, in effect, that he had decided to withhold the "Fund" from the Board of Health, and to disburse it in accordance with the "discretion" conferred by the President, as he himself might think proper. This decision of the Secretary was immediately followed by an order directed to the Surgeon-General of the Marine Hospital Service, conferring upon him full "discretion" to use the "Epidemic Fund."

This decision was an unexpected blow, not only at the usefulness, but at the very existence of the Board. It withheld from the only branch of the public service authorized by law to exercise public health functions the means by which it was to perform its duties, and imposed upon a bureau of the Treasury duties of which the statute had expressly deprived it. It was now only too evident that the National Board was to be supplanted, and that the change in the appropriation of the "Epidemic Fund," by which it was to be expended at the discretion of the President, "was the first step in the process." The transfer of the "fund," and the "discretion" to use it, to the Secretary of the Treasury by the President

was the next step, and the consummation naturally and immediately followed.

Unable now to continue its work, and to maintain the several branches of service at the Refuge Stations and on the Mississippi River, but desirous that the greatest possible measure of protection should be afforded the people against the commencing epidemic, the board decided to turn over to the President immediately the public property belonging to it employed in aid of the State and local boards of health, as boats, hospital accommodations, and other equipments, at the stations on the Mississippi River, and at the stations Ship Island, Sapelo Sound, and Norfolk, to be used by him for the purposes for which they were intended, until Congress should provide the board with means for carrying on this branch of its work.

During that season yellow fever prevailed extensively in Texas, and also at Pensacola, Fla. The public health service was now, for the first time, under two jurisdictions; the officials of the Treasury expending the "Epidemic Fund" chiefly in Texas, and in operating the Refuge Stations established by the board, while the National Board employed its limited means in aid of the health authorities of Pensacola.

At the session of Congress 1882–83, the Board endeavored to secure a re-enactment of the law of June 2, 1879, which, under the four years clause, would expire in June, 1883, but no action was taken to that end. Congress appropriated no money for the work of the board, and again placed the "Epidemic Fund" under the control of the President. The officers of the board again applied personally to the President, requesting him to empower the board to employ the "Epidemic Fund" in preventive measures in the event of a threatened or an actual epidemic. State boards of health and health organizations petitioned the President to the same end, but it was again turned over to the Treasury Department and used by its officials. The Board of Health was thus not only stripped of all power to carry on its work, but also of funds with which to maintain an independent existence.

At its last session Congress appropriated a small amount to meet past deficiencies, and to provide office accommodations. The "Epidemic Fund" was placed again at the discretion of

the President, who turned it over to the Treasury Department, which has employed it through its agents.

The position of the National Board of Health since its duties and funds were transferred to a Bureau has been and is that of a well-organized branch of the public service, fully equipped with every necessary appliance to perform efficiently and economically the duties assigned to it by law, but which is powerless to act owing to the diversion of its funds to another channel. Though deprived of the means of performing its legitimate duties, and divested of its most important powers, the board as a body has maintained a dignified position, seeking on every proper occasion to impress upon Congress the importance of sustaining its work, avoiding contention, and in the interests of the public health promptly aiding, with all its material appliances and equipments, the department which assumed its functions.

Throughout its active life the National Board was loyally and vigorously sustained by the American Public Health Association, by State and municipal boards of health, by sanitary organizations, and by the National Academy of Sciences. The members of the board, most of whom have held their positions at a personal sacrifice, have been cheered and sustained by resolutions of confidence of these bodies, and by encouraging words and communications from sanitarians and the more prominent members of the medical profession throughout the country. Differences of opinion have naturally arisen as to the necessity of a national health authority; whether it should be a board, or a health officer; whether the plan of organization of the present board is adequate to the necessities of the service; what is required in the present anomalous state of national health legislation. These are questions of the utmost importance, and demand the most serious consideration. The following views are submitted on these several questions:

1. *Is a national health organization necessary?* All history answers in the affirmative. Every enlightened nation of ancient or modern times has found it necessary to organize and give full effect to a central health department before it could successfully combat foreign or domestic pestilences. Our own experience as a nationality, in contending with epidemic dis-

eases of foreign origin, gives terrible emphasis to the same conclusion. Yellow fever and cholera have repeatedly devastated this country in spite of the most strenuous efforts of local health boards to prevent them, and yet it is possible to protect the country from either pestilence by measures which the national authority can inaugurate and enforce, and in co-operation with State and local health boards. It has been alleged that a national health organization can have no functions to perform in our system of government, but experience proves the contrary. During the six years of its existence, the National Board of Health had but three years of active and unembarrassed labor, yet in that period it undertook and accomplished an amount of pioneer work in the creation of national defences against foreign pestilences, and organizing measures against epidemics, of immense and lasting importance and value to the people of the United States. It demonstrated the necessity of a central national health authority, and the special functions which it has to perform in any adequate system of preventive measures against epidemics. It proved the practicability and importance of uniting in harmonious co-operation national, State, and local health authorities in a combined effort, first, to prevent the invasion of pestilences, and, second, to stamp out existing epidemic diseases hitherto widespread and devastating.

2. *Should the national health authority consist of a board, or of a single officer?* Experience abroad and at home throws much light on this question. Abroad, boards of health are preferred to single officers. Even the English Government, having perhaps the most thoroughly qualified sanitary student of Europe as its health officer, reorganized its public health service under a Board. In this country, with its separate State Governments, its immense territory, involving the greatest variety of sanitary conditions, and its commercial relations with every nation of the world, a Board of Health having a membership representing all these diversified interests would seem to be an absolute necessity. No single person, whatever may be his ability or experience, could possibly administer adequately the varied and intricate functions which our national health authority should exercise. Experience has amply proved the wisdom of Congress, which,

after the most mature deliberation, rejected a health organization with a single head, and adopted the plan of a Board. The records of the Board will prove to any one familiar with State medicine, and the problems which it presents, that during the three years of its active existence the National Board of Health has repeatedly been required to determine public health questions of national importance, which could never safely be left to the arbitrary decision of any single person, whatever may be his capabilities or experience. It must be borne in mind that the duties of the central health authority of this country must be rather deliberative than executive. And we may pertinently add, if it be true, as has been alleged, that the present Board of eleven members, seven of whom are appointed by the President for their special fitness for their duties, and four are elected from the departments of the Government for like qualifications, is liable to, and actually does, commit grave errors of judgment, and mistakes in execution, what dangers must beset such public service when all its delicate and responsible duties are intrusted to the unaided judgment of a single person!

3. *Is the present plan of organizing a National Board of Health adequate to the necessities of the service?* As my own views of the kind of central health authority required to meet the conditions peculiar to this country were originally adverse to the present organization, and as I have been familiar with its operations from the first, I can express my opinion without prejudice and from experience. Theoretically, no better method could be devised of creating a board, which at once was representative in its character, and combined the several departments on an equal and equitable footing. Practically, the wisdom of the plan of creating such a board has been fully demonstrated. The members appointed represented not only the varied sanitary interests of different sections of the country, but they were experts in a knowledge of the epidemics peculiar to their respective sections, and of the best measures of prevention. In the conflict which the Board had to enter upon soon after its organization, with the great epidemic of yellow fever of 1879, the immense value of the efficient counsels and personal services of the members, familiar with the peculiarities of the scourge and of the people afflicted, was daily ap-

parent. Nor did the Board prove to be an unwieldy body in the execution of its duties. On the contrary, by the organization of an executive committee composed chiefly of resident members, who could be summoned in council in ten or fifteen minutes, not only was there a rapid despatch of business, but every item had the careful consideration of at least four expert men, one of whom was the Solicitor-General. Twice in each year the whole board met and reviewed the past work of the executive committee, projected the future operations of the board, and deliberated with the greatest care and patience upon those new and untried subjects which involved vital questions of public policy. And, from a considerable experience in similar bodies, I take the liberty of adding that, while there was often the greatest diversity of opinions expressed on individual subjects, there was always the most perfect acquiescence in the conclusions reached. This diversity in the discussion of sanitary questions shows the importance of a Board in determining the policy to pursue in the administration of health laws, while the unanimity of the board in carrying out the decisions of the majority proves that the organization is admirably adapted for its purposes. In my opinion, therefore, the plan of organization of the present Board is the best that has been, and perhaps can be, devised. It is a representative body, and hence far more in harmony with our form of government than a bureau with a single head; it combines in its membership every variety of knowledge necessary to judicious decision, and in its action has the force and precision of a single hand. Nor do I believe that its duties and powers should be curtailed or transferred to any other branch of the public service. The Board has fully demonstrated its ability to solve the problem of preventing the introduction of foreign pestilences into this country, and their spread from one State into another; to aid judiciously local and State boards of health in their efforts to suppress epidemics, and to organize and conduct exhaustive investigations into the causes of diseases of national concern. But, more than this, all the health powers and duties of the General Government should be conferred upon and exercised by one branch of the public service, which should be fully equipped for the purpose. Divided responsibility must end in inefficiency and failure.

4. *What is required to correct the present anomalous state of the national public health service?* This question is of momentous importance to the people of the United States. Always menaced by yellow fever, and now threatened with a visitation of cholera, the most virulent since the epidemic of 1832—two preventable pestilences—our Government presents to the world the ridiculous spectacle of having a well-organized and competent Board of Health destitute of power or funds, while all the funds for public health duties are placed at the "discretion" of the President, who turns that "discretion" over to a subordinate officer, and he again turns the "discretion" over to one of his subordinates. Thus the powers and duties of the national public health service have undergone successive dilutions, until there is now nothing left of a once vigorous Board of Health, but the name and organization; and of an efficient administration of public health duties, but such good offices as the officials of the Treasury may render. The only remedy for these evils is the passage by Congress of a law that shall leave nothing to the "discretion" of a public officer, but which shall, in plain and definite language, confer upon a health department adequate powers, and furnish it with ample means to perform efficiently its duties. While efficiency and economy should govern a department in the administration of public affairs, it is certain that in the prevention of epidemics efficiency is too often sacrificed to economy. With remarkable force, a Senator in Congress, protesting against meagre appropriations to the Board of Health for the prevention of epidemics, exclaimed, "You give $10,000 to prevent an epidemic which costs the country $20,000,000 loss when once it obtains a foothold on our shores!" It is a simple truth that the estimated pecuniary loss to this country by the yellow fever epidemic of 1878 would have sustained the National Board of Health, at its current rate of expenditure, ONE THOUSAND YEARS! But pecuniary loss to the country should count for nothing when weighed in the balance against the sickness, loss of life, and misery which pestilence leaves in its train. Spain has, during the present epidemic of cholera, lost 100,370 of its people, while 271,223 other persons have suffered from attacks of the scourge. How vain it would be to attempt to estimate,

in any pecuniary way, the loss to that country which these figures imply!

In the firm belief that this country could be protected from foreign epidemics, as cholera and yellow fever, by the National Board of Health, or, if they succeeded in gaining a foothold, that they could be prevented from spreading from one State into another, and quickly stamped out by its co-operation with State and local boards of health, it seems to me of vital importance that Congress should, at an early period of its session, clothe that board with all the power that can be lawfully given it, and supply it with adequate funds.

EDITOR'S TABLE.

THE AMERICAN PUBLIC HEALTH ASSOCIATION.

THE indications are, at the time of this writing, that the forthcoming meeting of this Association is appreciated as being one of the most important it has ever held. Surely, at no meeting since 1878 has the subject of epidemic diseases, and the means by which they may be prevented, excited so much attention. It is at least hoped that this meeting may result in an exhibit of such practical knowledge of preventive measures as will greatly mitigate, if it does not indeed wholly remove, the fear of the introduction of cholera, and that such action may be taken with regard to the still more menacing epidemic, the small-pox, as will satisfy the public on the *absolute necessity* of vaccination. The third collective topic of the programme (published in November number) comprehends these subjects, and, from the titles of papers announced, it is reasonable to conclude that the Executive Committee will provide time for their full discussion.

The Lomb Prize Essays are also full of significance, and the proposed awards so generous as to raise expectations high with regard to the outcome. But every member of the Association should be alive to its honor and the *terms* of the award.

" *The judges* have been selected by the American Public Health Association, the Conference of State Boards of Health,

and the National Board of Health, and *are empowered to reject all papers if, in their opinion, none are worthy of a prize.* . . .

"It is intended that the above essays shall be essentially American in their character and application, and this will be considered by the judges as an especial merit. . . .

"It is expected that arrangements can be made to have these essays widely distributed to the public, and to the persons mostly interested in the respective subjects in the United States."

THE NATIONAL BOARD OF HEALTH.

No one interested in the importance of sanitation in the United States should omit to read the sketch of the "Origin, Work, and Present Position of the National Board of Health," by Dr. Stephen Smith, on other pages of this number. Dr. Smith is well known to be among the foremost promoters of sanitation in this country; not by any means as a mere observer, but as a pioneer, continuous practical worker, and contributor to scientific sanitation—city, state, and national—from its very beginning among us to the present time; and, from his various relations to the subject, no one is better qualified than he to give a clear and wholly impartial view of the purpose, work, and present status of the National Board.

SMALL-POX, CHOLERA, AND YELLOW FEVER.

A summary of the reports of the National Board of Health since October 17th to November 18th, shows the continued prevalence of *small-pox* as follows:

In Canada at thirty places, and still severely epidemic in Montreal.

For the four weeks ending November 11th the number of deaths reported from small-pox in Montreal and adjoining municipalities was 905.

Of other foreign cities small-pox appears to be the most prevalent at Buenos Ayres; for the month of May 92 deaths.

In Gayamas, Mex., the number of deaths reported from small-pox for the month of October was 6.

Deaths from small-pox, from 1 to 10 weekly, to the most recent dates, are reported from the following foreign cities: London, Paris, Bordeaux, Copenhagen, Zurich, Rheims,

Prague, Glasgow, Edinburgh, Geneva, Leghorn, Venice, Riga, St. Petersburg, Trieste, Warsaw, and Antwerp.

Cholera reports from Italy, September 23d to October 6th, 2,343 cases, 1,146 deaths; of the whole number 1,270 cases and 58 deaths were reported from Palermo.

From Spain, September 24th to October 20th, there have been reported 7,100 cases and 2,709 deaths.

Cholera is also reported, at most recent dates, at Hioga, Nagasaki, Japan; Colombo, Ceylon; Shanghai, Bombay, and Calcutta.

Yellow Fever continues at Havana, 12 deaths for the week ending October 31st; St. Thomas, Laguayra, and Rio; and, under date of September 19th, 1 case and death at Callao.

DRS. HOLT AND BELL ON DISINFECTION.

It affords the editor of THE SANITARIAN great pleasure to publish the following extract from a communication by Dr. Joseph Holt to the *New Orleans Medical and Surgical Journal* for November, in complete satisfaction with the result of a brief controversy over a matter in which both parties, in common with all sanitarians, take a deep interest—the importance of thorough disinfection for the prevention of epidemic diseases:

"I will frankly acknowledge that my remarks, calling forth a reply from Dr. Bell, were stimulated by a feeling of resentment occasioned by his editorial in the June number of *The Sanitarian*, which, by some unfortunate kink in my interpretation, I construed as animadverting with ridicule upon the editors of this JOURNAL and myself, exposing jeeringly our ignorance in not being possessed of certain information familiar to himself and assumed to be generally known.

"While wrong in allowing myself to become irritated, there is some palliation in the universal frailty whereby we all, children and old folks alike, repel with indignation any instruction or correction of an error offered through the medium of contemptuous ridicule. Nothing so quickly arouses a spirit of resentment, even in the meek and lowly (neither of which we are), or makes a school-master more thoroughly despised. No incentive lends such zest in a fight.

"This method of imparting knowledge, when adopted by one to whom we have looked up as a high priest in the inner sanctuary of the temple of science; as a specialist, whom we

know to be erudite in all that appertains to preventive medicine, and from whom we have expected information and guidance, bestowed in the tender spirit of a grand philanthropy; by one for whom we have long entertained a feeling of the highest personal regard; this method, I say, did take me aback with a shock of astonishment reacting in a flush of anger, which threw me off my guard and committed me to a harshness of expression unwarrantable in the light of facts revealed by a recent perusal of the JULY number of *The Sanitarian*.

"It matters not what others may think or say, I am determined no trivial pique shall place me in a permanent attitude of hostility toward Dr. Bell, disrupting ties strengthened by years of pleasant acquaintance and several acts of kindly consideration on his part. Moreover, when I wage war I wish to fight my enemies, and not those who are engaged in the ranks with myself; above all, I intend to avoid anything that could wound the feelings or enkindle the enmity of one whose life of service in the cause of humanity should command in his age the respect and affection of all true men.

". . . It was never my intention to include the idea of what is possible to be accomplished.

. . . . . .

"It is possible to lift a steamship over the Brooklyn Bridge, but to propose it as a practicable route up East River is, to my mind, on a par with steam adopted in quarantine for general service on account of its '*easy mode of application for the disinfection of vessels.*' That a ship can be disinfected by steam I have not questioned.

. . . . . .

"In reasserting my convictions of the impracticability of steam as an available disinfectant for general service in quarantine, it is not done with the intention of advocating or defending any other system.

"Any plan, it matters not who suggests and puts it into operation, is successful in direct proportion to the reconciliation accomplished between the conservation of the public health on the one hand, and commercial freedom on the other.

"When Dr. Bell, or any other sanitarian, shall come forward with agents demonstrated to be of a higher disinfecting power, one wherewith to displace mephitic atmosphere, and another to apply to surfaces, baggage, etc., freer from injurious effect upon ship, cargo, and textiles, safer to handle, and less expensive, we will discontinue the sulphurous acid gas and bichloride of mercury at once, and adopt the new. But all of these qualities must be proven."

Dr. Holt, and all others who may have had their interest in disinfection intensified by the apparent controversy between him and Dr. Bell on the subject, will please be assured that Dr. Bell has long been, and still is, actuated by the same spirit as that which is so well expressed in the concluding paragraph of the above quotation of Dr. Holt's remarks. Dr. Bell is wedded to no particular process of disinfection any longer than until a better may be found. Twenty-five years ago, as Chairman of the Committee on Quarantine Regulations of the National Quarantine and Sanitary Convention, held in Boston, 1860, he reported the following article:

"If in the judgment of the sanitary authority the vessel requires it, he may order the following hygienic measures: Baths and other bodily care for the *personnel*, washing or disinfecting means for clothing; displacement of merchandise on board, or complete breaking out; subjection to high steam, incineration, or submersion at a distance in the sea of infected articles; the destruction of tainted or spoiled food or beverages; the complete ejection of water; thorough cleansing of the hold, and the disinfection of the *well* (bilge); in short, the complete airing and ventilation of the vessel in all her parts, by the use of force-pumps, steam, fumigation, washing, rubbing, or scraping, and finally sending to an isolated anchorage ground. Whenever these divers operations are deemed necessary, they shall be executed in the more or less complete isolation of the vessel, according to circumstances, but always before admission to *pratique*."

Subsequent observation and considerable additional practical experience have fully confirmed this conclusion—that the best practical means under the circumstances should always be used, and every means possible should be subject to the judgment and use of the sanitary authority for the destruction of infection wherever it may be found, as the only reliance for public safety from epidemic diseases.

"YELLOW FEVER AND THE EFFICACY OF QUARANTINE," is the caption of an excerpt from the September number of THE SANITARIAN, with remarks by Dr. S. T. Armstrong, United States Marine Hospital Service, in *The Medical Record* of November 21st, wherein the writer wrongfully attributes an animus to our criticism on the quarantine practice of that service at

the Delaware Breakwater, in relation to the bark John Gibson, last summer.

The case was, briefly: When we supposed the Health Officer of the Port of New York wholly responsible for admitting the infected vessel to *pratique* without disinfection, we pointedly inquired, "Why, in the interest of a human life, the public health, and of commerce, was not that ship disinfected *within twenty-four hours* from the time of her arrival, instead of being detained nine days, and then sent on her way via New York, bearing disease and death?" To this Dr. Smith, Health Officer of the Port, took exception, addressing us the note which Dr. Armstrong characterizes as unprofessional, stating that the vessel in question arrived at the New York quarantine with a *clean* bill of health from Dr. William P. Orr, the quarantine officer of the Marine Hospital Service at the Delaware Breakwater, with written addition, "This bark, John Gibson, has been cleaned and fumigated." Our animadversion upon the receipt of this letter from Dr. Smith was: "It is evident that no protection is afforded by it" (such a quarantine) "to the cities on the Delaware or anywhere else; and that the sooner it is abolished the better. A vessel that has been 'cleansed and fumigated,' and communicates yellow fever within a week thereafter, alongside of the wharf of a populous city in midsummer, is a dangerous specimen of sanitary service. It has at least demonstrated to the Health Officer of New York that such cleansing and fumigation should not again pass his scrutiny."

Our opinion of the utter worthlessness—ay, more, the danger to the public—of all such service is so well, and has so long been known, by frequent repetition, as to leave no room whatever for any one to construe it as personal.

The fault of Health Officer Smith in this case, as it appeared by his note, was, he accepted the averment of Dr. Orr that the vessel was *clean;* he did not take the same exception to such authority as he has learned the necessity of taking to "*clean*" bills from abroad; and the result was as stated. Dr. Armstrong furnishes additional evidence of the worthlessness of the means used, in his statement that, notwithstanding "Health Officer Smith decided it would be safe to honor her bill of health, he took the precaution to fumigate the vessel again."

If in the light of the overwhelming evidence of the utter worthlessness and danger of the mere perfunctory impositions as those practised in the case of the John Gibson, no matter by whom, are persisted in, instead of disinfection and cleansing, we sincerely trust the time is not far distant when those who practise them will be indicted for criminal incompetency.

IOWA.—The Third Biennial Report of the State Board of Health, for the fiscal period ending June 30, 1885, is embellished with an excellent portrait of the late Secretary, R. J. Farquharson, deceased, and a brief tribute to his memory. Two of his latest and excellent papers—"The Typhoid Fever of America," read before the Board, November 2, 1883 (published in THE SANITARIAN, vol. xii., pp. 26–38), and "Sanitary Science and Hygiene," read before the Iowa State Medical Society, May 21, 1884, are among the contributions of the volume. The other special contributions to this volume, in addition to the general report of the Board in detail, are "Sanitary Science and Public Hygiene, and Over-pressure in Schools," by the President of the Board, W. S. Robertson, A.M., M.D.; "Hygiene of Public Institutions," by Albert Reynolds, M.D., late Superintendent of Iowa Hospital for Insane; "Lighting and Heating School-houses: Defects and Remedies," by L. F. Andrews, Acting Secretary of the Board; "Rest," by E. M. Reynolds, M.D., member of the Board; "The Opium Habit," by J. M. Hull, M.D., member of the Board, and extensive correspondence on numerous practical subjects. Under the general title of the "Report of the Secretary," Dr. I. F. Kennedy, the successor of Dr. Farquharson, continues the summary of the Board's work from the date of his predecessor's death, September 6, 1884, without a break; comprehending a large amount of aggressive work for the prevention of epidemic diseases, the promotion of the public health, statistical information showing the localities from which reports have been received, the number of physicians of local boards of health who have reported, number of cases of infectious diseases reported, etc. Full meteorological tables of the chief centres of population are also appended, altogether making a volume of 584 pages of great value to the welfare of the State.

SAN FRANCISCO.—Annual Report of T. L. Mears, M.D., Health Officer for fiscal year ending June 30, 1885; including Reports of W. F. McAllister, M.D., Quarantine Officer; W. F. Bell, M.D., Resident Physician, Twenty-sixth Street Hospital, and Charles Blach, M.D., City-Physician and Police-Surgeon.

During the year there were 5,288 deaths—470 of which were Mongolians. Estimating the population at 270,000, 19.58 per 1,000; Chinese population, 22,000, 21.36 per 1,000. Among the more prominent causes of death there were from dysentery and diarrhœa, 111; cholera infantum, 77; diphtheria, 213; typhoid fever, 138; consumption, 719; pneumonia, 406; bronchitis, 140; other diseases of the respiratory system, 170. There were 111 deaths from unascertained causes; of these 101 were Mongolians. The Health Officer refers to a special report which he made in 1876 on the "Chinese quarter," from which he quotes, and reiterates as equally applicable to the present:

"That these people, alien to our laws, alien to our religion, alien to our civilization, neither citizens nor desiring to become so, were a social, moral, and political curse to the community."

House to house inspection is not only urged for the Chinese quarter, but throughout the city, with special reference to such knowledge and measures as are deemed necessary for the prevention of cholera and other infectious diseases. The filthy condition of the sewers and some of the streets, and necessary action for its removal are urged upon the municipal authorities as absolutely necessary for the preservation of the public health. At the quarantine there arrived only one infected vessel during the year, as evidenced by a convalescent from yellow fever on board of one of the Pacific Mail steamers. "For the past two years all vessels arriving cleared from East India ports leave with foul bills of health:" hence, it is the wise conclusion of the Quarantine Officer to disinfect all such vessels, no matter what the clearance bill.

WARMING AND VENTILATION.

The economy of warming is frequently urged and practised to the sacrifice of health, no allowance being made in the ex-

penditure of fuel for ventilation. To avoid this evil, particular attention is invited to the "*Heat-Saving and Ventilating Grate*," manufactured by Edwin A. Jackson & Bro., advertised in this number.

The use of this grate fulfils the twofold purpose of warming and ventilating simultaneously. Even with the doors and windows made as tight as possible to exclude the fresh air, which is the great bugbear of some people under the name of draught, the "Jackson Ventilating Grate" possesses the advantage of making amends by a special provision for fresh air in its construction and setting. Moreover, in rooms where the doors and windows are not well fitted, with open crevices, the draughts from them will be prevented, or at least compensated for, by the constant inflowing current around and from the grate, which never ceases while there is fire in it.

TRAPPIST CHEESE.—Among those religionists in European countries who object to the consumption of animal fibre, eggs and the product of the dairy, especially cheese, constitute their diet. The cheese manufactured by the Trappists of the monastery of Port du Salut, which is now used by most of the monastic communities in France, is one of the most perfect substitutes for animal food. It was confined to the locality where it is produced until the Exposition in France in 1867, when it was then shown, and a gold medal was awarded to it. It became famous, and immense orders were sent to the monastery. Its success has been so great that the monks not only use all the milk of their own cattle, but have been compelled to purchase every drop they can get from the farms within a considerable radius of their house. It is, when fresh, a soft, pasty, mild, most palatable cheese, generally made in round cakes of from five to eight pounds in weight, and stamped with a cross and words showing its place of manufacture.

IMPERIAL GRANUM has stood the test of experience with better results, as an artificial food for infants and as a superior easily digested food for invalids, than almost any other dietetic preparation in the market. It is an elegant preparation of invariable quality, and generally acceptable to the most delicate stomach.

LITERARY NOTICES.

THE PHYSICIAN'S VISITING LIST (Lindsay & Blakiston), for 1886, thirty-fifth year, is too well known to require anything more than announcement, for it is generally recognized, by thousands who cannot afford to do without it, as the quintessence of all that is essential in matter, arrangement, and portability. Price (twenty-five patients weekly), $1. *Nine* sizes, twenty-five to one hundred patients weekly, $1 to $3. Philadelphia: P. Blakiston, Son & Co.

THE PLUMBER AS A SANITARY EXPERT. By JAMES ALLISON, Sanitary Plumber, Cincinnati, O. Pp. 11. Reprint of paper read before the National Convention of the Master Plumbers' Association of the United States, St. Louis, Mo., June 24, 1885.

This paper comes boldly up to the mark in the assertion that the great and crying need of the plumbers' craft is *education;* that with it the plumber, as a sanitary expert, holds the first rank among sanitary workers for the promotion of healthy dwellings, by the prevention of disease-producing conditions. "Work not in accordance with acknowledged laws is neither practical plumbing nor expert sanitation. In a word, we are practical plumbers in the modern sense, only so far as our knowledge of sanitary science extends, and no further." This is healthy doctrine, worthy of an extensive following.

TRICHINA SPIRALIS AND TRICHINOSIS, including an Examination of Indiana Hogs, prepared under the direction of the Indiana State Board of Health, by Thomas B. Redding, A.M , M.D., New Castle, Ind., p. 45.—This is a sketch of the natural history of trichina spiralis, and with an abstract of the data of the number of hogs found to be infected in Europe and America since the parasite was first clearly described by Leidy, in 1846, to the present time; together with the author's own researches since 1881, to which is appended a bibliography of the subject. Of a total of 550 hogs examined in Indiana since 1881, twenty-five, or a fraction over 4½ per cent., were found to be infected. "The highest percentage of infected hogs

were those of the retail butcher shops—17⅓ per cent. In this case the animals intended for sale were kept from a few days to several weeks about the slaughter-house, and fed upon animal refuse and offal from slaughtered animals. No doubt this was the source of infection in most of the cases."

CREMATION IN ITS SANITARY ASPECTS: THE TORCH *vs.* THE SPADE. By John O. Marble, M.D., Worcester, Mass. Read before the Massachusetts Medical Society, June 10, 1885, pp. 35.—This is a concise statement of the dangers of intramural burial of the dead, and the advantages of cremation—especially with regard to epidemic diseases—with an Appendix describing the Ancient Pyre and the Modern Incinerator, Cremation and Extravagant Funerals, Cremation and Evidence of Crime, and the Massachusetts Law regarding Cremation.

HISTORY OF THE LATE VACCINATION CONTROVERSY IN THE CITY COUNCIL OF ROCK ISLAND, ILL., is a pamphlet of 42 pages, comprehending in brief the testimony of a large number of the most distinguished health officers in the United States, in favor of sustaining a health ordinance providing for compulsory vaccination for the prevention of small-pox.

INEBRIISM, A PATHOLOGICAL AND PSYCHOLOGICAL STUDY. By T. L. Wright, M.D., Member of American Association for the Cure of Inebriates. 12mo., pp. 222. Price, $1.25. The Author: Columbus, O.

This book is well designated by its title—a pathological and psychological study of the effects of alcohol; but in its utilitarian aspect its conclusions are inconsistent with its philosophy. While it shows the effects of alcohol in destroying the power of the will, it concedes the legal right of an individual to get drunk—to wilfully and deliberately put himself in a condition to commit crime, and would neither punish him for getting drunk nor for the criminal act! It sinks the "human conduct" of getting drunk, "directed by a conscious ego" which "comes of a capacity to discriminate between right and wrong, and excuses the unconscious" ego, "thus *wilfully created*, which is incompetent to discriminate between right and wrong": A convenient doctrine surely for him who would wreck a train of cars, or sink a ship, and escape punishment, but a terribly dangerous doctrine for society.

THE INEBRIATE HOME, Fort Hamilton, N. Y., Seventh Annual Report of the President for 1884, reports patients remaining January 1, 1884, 127; admitted during the year, 344: 471. Four have died; two have been transferred to hospitals, and three to the lunatic asylum; 328 left during the year; 139 of these are engaged in business and doing well; 49 unimproved; 78 lost sight of; 55 were readmissions; 7 died since leaving the institution.

"The institution has been filled to its utmost capacity during the whole year, and admission could only be obtained by waiting for a vacancy to occur.

"The trustees have already made arrangements to enlarge the building, which will probably be completed by spring, thus considerably increasing the capacities of the institution for the care and maintenance of free patients."

DANIEL'S TEXAS MEDICAL JOURNAL is one of the most progressive and cogent periodicals on our exchange list—always fresh in both matter and manner. Monthly, $2.00 a year. F. E. Daniel, M.D., Austin, Texas.

THE EUREKA RECITATIONS AND READINGS, by Mrs. Anna Randall-Diehl, is a very good collection of prose and poetry, adapted for schools, associations, reading clubs, temperance societies, etc. J. S. Ogilvie & Co., New York.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE STATE OF TENNESSEE. Pp. 144. C. C. Fite, M.D., Secretary, Nashville. The fifty-second annual meeting, of which this pamphlet accounts, was held at Nashville, April 14, 15, and 16, 1885. The meeting was welcomed by the Governor of the State, and a representative of the city government. The annual address, by Dr. D. D. Saunders, President, was a stirring one, on "The Debt Every Man Owes His Profession," reviewing the progress made by working members and exhibiting in bold contrast the far more numerous hangers-on, or drones who live by the sweat of other peoples' brows. Of over two thousand doctors in Tennessee, less than one hundred were in attendance at the meeting. Could his stinging words have reached the absentees, possibly some of them might have been aroused from their lethargy.

Of the stated papers, the only ones related to preventive medicine were "Malarial-Remittent Fever," by R. F. Evans, M.D., and "Epidemic Cholera is More Easily Prevented than Cured," by J. W. Penn, M.D. The former is chiefly speculative on the relations of typhoid, typho-malarial, and malarial fevers, with a bare allusion to preventive measures, depending upon the uncertainty of the essential cause. The former accepts the theory of a *contagium vivium*, and upon this would urge every practical means by which it might gain lodgement in drinking water, or in the surroundings of any community, by the exercise of the strictest possible sanitary measures.

The most animated discussion was upon the form of a bill, finally agreed upon, to Regulate the Practice of Medicine and Surgery in Tennessee.

PROCEEDINGS OF THE CONNECTICUT MEDICAL SOCIETY, 1885: Ninety-fourth Annual Convention, Hartford, May 27th and 28th. S. B. St. John, M.D., Secretary, Hartford, Pp. 239.—Besides the summary of special committee and county reports, covering a detail of extensive observation on subjects of practical interest to the profession throughout the State, there are essays on "Centennial Observations on the Past, Present, and Future of the Connecticut Medical Society," by Dr. S. G. Hubbard; the "Internal Use of Germicides," by Dr. W. W. Knight; "Are there any Symptoms or Criteria by which we may Diagnose Insanity from Crime, when made as a Plea for Criminal Acts," by Dr. P. Cassidy; "Angina Pectoris," by Dr. S. W. Turner; "A few Suggestions on the Therapeutical Uses of Capsicum," by Dr. A. T. Douglas; "Treatment of the Stricture of the Urethra," by D. F. H. Whittlemore; "Surgical notes from the Case-Book of a General Practitioner," by D. W. C. Wile; and to these may be added the excellent presidential address on "Nervousness," by Dr. E. C. Kinney.

"Obituary Notices" comprehend tributes to the memory of C. W. Chamberlain, Hartford; Eli Warner, Hartford; George W. Edwards, Granby; Ambrose Beardsley, Birmingham; A. H. Abernethy, Bridgeport; O. S. Hickok, Ridgefield.

Appended is a complete list of members, and a proposed charter to be acted upon at the next meeting.

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